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ORIGINAL ARTICLES.

DISEASES OF THE LACHRYMAL PASSAGES—THEIR CAUSES AND MANAGEMENT.

Read before the Monroe County Medical Society.

BY LEARTUS CONNOR, A.M., M.D.

DETROIT, MICH.

The lachrymal passages are insignificant in size, but their diseases tax to its utmost the resources of surgical art. There are few constitutional conditions with which they may not be associated, while the technique of their diagnosis and operation calls for sound judgment and the finest manipulative skill. Failure to recognize anatomic deformities or the cause of the lachrymal disease renders futile the highest operative technique; while the most profound appreciation of causation or pathology can not cure without such technique.

The study of a million cases, treated in public clinics, shows that diseases of the lachrymal passages form about 2.5 per cent. of all eye cases. In private practice the proportion is larger, as well-to-do people seek surgical relief sooner. My records of 7909 cases show that 493, or about one in eighteen, had some disease of the lachrymal passages.

The causes of diseases of the lachrymal passages are general and local, functional and organic. Notable among general diseases is syphilis. By lesions of the eyelids it may evert the puncta, causing epiphora; by lesions of the conjunctiva directly, or indirectly through the iris, it may evert the puncta or obstruct the canaliculi or extend to the sac and cause a dacrocystitis. More frequently syphilis induces dacrocystitis by attacking the nose, the duct or adjacent bones. This may take the form of periostitis, endostitis or subperiosteal gumma. A mucous patch on the wall of the nose over the site of the mouth of the duct may obstruct the flow of tears. Purulent dacrocystitis indicates, generally, disease of the periosteum or caries of the bone about the duct. The bony wall of the duct may be destroyed by caries or necrosis, the sequestra of the latter calling for removal by operation. Gummy growths occur in the wall of the duct and sac, obliterating the passage very rapidly and leading to suppuration. Hyperplastic processes of the bones themselves have been known to encroach upon and obstruct the lachrymal passages. Gout, rheumatic gout or the state antedating the acute attacks is responsible for many cases of lachrymal diseases attacking the bony, fibrous or mucous tissues here as in other portions of the body. Tubercular and scrofulous disease not infrequently invades some portion of the lachrymal passages, as also do the infectious diseases, scarlet fever, diphtheria, measles, typhoid fever smallpox. All these and other constitutional diseases may approach the lachrymal passages by first inducing a conjunctivitis or disease of the nose, and so attack the passages from either end or both. But a purely local conjunctivitis or blepharitis may cause obstruction, obliteration or malposition of puncta; narrowing of the lachrymal canals, inflammation of the lachrymal sac or engorgement of the lining membrane of the duct. This obstruction may be temporary as in congestion, or permanent as in stricture; it may be attended with an overflow of tears alone or tears thickened by mucus or pus, or both.

In like manner local disease of the nose may cause engorgement of the mucous membrane of the duct and its surrounding plexus of blood vessels; a thickening of the connective tissue, forming strictures; an ulcer may close the duct; a tumor may occlude it; hypertrophies or atrophies of the nares may obstruct to a greater of less degree the current of tears to the nose. Finally, defects of refraction may cause, directly or indirectly, disease of the lachrymal passages. That these defects do cause conjunctivitis and blepharitis is a fact long since established. It is also established that conjunctivitis and blepharitis may cause diseases of the puncta, canalicula and sac, therefore the possibility of eyestrain causing lachrymal disease must be granted. Besides, careful observation will show that the strained efforts to secure better correction of optical defects does occasionally turn the puncta from its normal position and so cause an overflow of tears or their undue retention within the tear passages and so favors their decomposition and renders tnem irritating. It disturbs the muscular rhythm by which the tears are forced through the canaliculi, sac and duct. In short, eye strain does in some cases derange the normal current of tears to the nose and incite disease of the lachrymal passages.

It is not true that every case of eye strain induces lachrymal disease, nor is it true that it induces blepharitis and conjunctivitis; it is only affirmed that in some cases it has such an effect. Clinically, for many years, I have observed that all cases of disease of the lachrymal passages had some defect of refraction, the correction of which clearly promoted treatment and in the milder forms was curative alone.

These several causes may induce disease of the lachrymal passages: By occluding the puncta in whole or part or by displacing it from its position against the eyeball in the lachrymal lake; by swelling the mucous membrane; by weakening or otherwise disturbing the action of the orbicularis; by diminishing the elasticity of the sac; by engorgement of the vascular plexus about the duct; by occlusion of the lower end or any portion of the duct; by the formation of structures; by ulceration of the mucous membrane, or by disease of the bony walls.

All lachrymal obstructions afford the microbic hordes an opportunity to render the tears so irritating as to extend the existing inflammation and intensify its character. As this process continues mucus and

then pus or a mixture of tears, mucus and pus results; the sac becomes distended and finally passes into a phlegmon of the connective tissues about the sac; the pent-up accumulation finally breaks through the skin and discharges upon the cheek. Watching the progress of these events in a patient, we find at first a slight cold, with red and tearful eyes. While the redness and constant epiphora soon disappear, slight irritation by dust or wind causes the tears to again overflow, first at long intervals, then at shorter and shorter ones. A little swelling is observed at the inner angle of the eye, pressure upon which is followed by discharge of mucus and tears into the lachrymal lake or the nose. The intervals between the refilling of the sac gradually diminish until it is almost constantly full. Now, after some undue exposure, a swelling is noticed about the sac, red, tender, growing with much rapidity, very painful, often mistaken for erysipelas and finally after great suffering the phlegmon breaks and discharges its mucopurulent contents upon the cheek. Unless the natural openings of the sac become free with the reduction of the swelling, the discharges continue upon the cheek causing distressing excoriation, the tears and mucus gather between the eyelids, obstruct vision and finally flow over the lids to the cheek, keeping the eye red and the subjacent skin inflamed. If by some accident an abrasion of the corneal epithelium occurs the malignant germs enter and take possession, causing corneal ulcers, abscesses or even iritis. Neglect of these, equal to that of the lachrymal passages, is followed by great crippling of vision if not entire loss.

It will aid an intelligent management of these cases to bear in mind a few points relative to the structure and functions of the lachrymal passages. They begin with the puncta of the upper and lower lids, continue inward to the sac, thence through the duct to the nose. The puncta are hardly larger than the point of a pin and held firmly against the eyeball, within the lachrymal lake. The canaliculi starting from the puncta pass perpendicularly to the edge of the lid for a little, then turn and pass horizontally inward to the sac, which they generally enter by a common canal. They are lined with pavement epithelium on basement membrane, surrounded by connective tissue and muscular fibers, offshoots from the orbicularis. The sac is lined with columnar epithelium, as is the duct, resting on basement membrane, and this upon an elastic wall, all filling the lachrymal fossa and partially covered by the internal ligament, which alternately compresses and relaxes the sac. The mucous membrane of the duct is like that of the sac, but surrounded by a rich plexus of blood vessels and the whole encased within bony walls and opening into the floor of the nose, behind the lower turbinated bone. Its membrane is thrown into folds at its mouth and at junction with the sac, which may easily be injured by careless probing. The canaliculi are narrowed at the junction of the horizontal portion with the sac and the perpendicular. As the tears emerge from the conjunctival and lachrymal glands they are swept along the eyeball by the closure of the lids toward the lachrymal lake, being set back from the inner commissure by the caruncle. The contractions of the orbicularis now force the secretion through the canaliculi into the sac; the latter by suction caused by its elastic rebound from previous compression aids in the movement. As the eyelids open the sac is compressed by the internal ligament and the tears pressed into the duct, whence they pass to the floor of the nose. Doubtless this is aided by the weight of the fluid, by capillary attraction and possibly by syphonage. In any given case the problem presented is to secure a permeable lachrymal passage with smooth lining membrane, puncta pressed against the eyeball in the lachrymal lake and normal muscular action and elasticity of the sac. The forces propelling the tears through the lachrymal passages are muscular action and sac elasticity. In the management of a case of lachrymal obstruction:

1. All eye strain should be removed, from either refractive error or loss of muscular equilibrium.

2. In all stages of every case much aid can be secured by the systematic local application of hot water; because of its convenience a tumbler is employed. Filled with hot water it is so placed that the entire eye is immersed within its contents. Varying with the effects called for, this application may be made for from ten to fifteen minutes every hour, or less frequently. The water must be as hot as the skin can bear without scalding. Thus used, hot water contracts the vessels with flabby walls, securing a more rapid current of blood therein, allays irritation, is a powerful aseptic and antiseptic and promotes repair of the diseased tissues, even within the sac and duct. To the water may be added any aseptic drug, as boric acid, and the conjunctiva washed therein by winking the eyelid.

3. In the earlier stages of lachrymal disease, the regular and systematic helping nature to empty the sac, using an aseptic solution to refill it, is attended with excellent results. It promotes a more nearly normal current of fluid through the passages, aids in restoring the lost elasticity of the sac, improves the tone of the orbicularis, reduces the engorgement of the mucous membrane and cleanses it of debris. Gould suggests the following method: The patient is placed in a reclining position, with the head thrown back and toward the side opposite the eye to be treated, in such a manner as to form a basin in the corner of the affected eye. This basin is filled with a solution of boric acid or other aseptic solution, and the forefinger alternately presses and relaxes the sac, practically pumping the fluid in the basin through the lachrymal passages. This should be done three or more times daily, for from five to ten minutes, according to the indications in each case. This is expected only to reach functional and inflammatory derangements, though if practicable it will benfit organic lesions.

4. For purposes of diagnosis and treatment, syringes with tips small enough to readily enter the puncta, are of value. There are many forms of these, but Anel's is most commonly employed. When the canaliculus is so opened as to admit of passing a fair-sized probe through the duct, de Wecker's canula probes may be used. Being introduced as is the probe, the style is withdrawn and a syringe attached to the upper end and the fluid passed through the passages. A syphon or fountain syringe may be attached and medicated or hot water forced through the passages to any desired amount, an advantage over the small syringes that compel removal with the discharge of the contents of one barrel, and a reintroduction, which is more or less painful.

5. In all cases the puncta should be examined with minutest care. If an eyelash be found within, it is readily removed with forceps; if a concretion or other foreign body be engaged in the perpendicular portion

of the canaliculus, it is removed by dilating and manipulation, or this failing, by slitting the puncta. If the puncta be permanently everted, the perpendicular portion of the canaliculus must be divided on the inside. A fine pointed scissors readily does this little operation. Should this fail a bit of conjunctiva is removed from the base of the vertical cut, and if this fails the canaliculus must be divided. The end sought by these operations is to secure apposition of the outer end of the canaliculus to the eyeball, within the lachrymal lake. If the puncta is partially occluded it must be dilated; if it is closed it must be opened, best by the canaliculus knife when the edge of the lid is placed upon tension by being pulled outward.

6. If there be reason to suspect stricture of the canaliculus, its location is decided by passing a lachrymal probe through the canaliculus to the sac. A small probe, No. 2 Williams' or Bowman's, is taken in the right hand between the thumb and finger and the patient's head steadied against the operator's chest. The forefinger of the left hand draws the edge of the lower lid outward and downward so as to make the canaliculus straight and tense. The point of the probe is inserted vertically in the puncta and when fairly entered, turned horizontally in the line with the canaliculus. With gentle, firm movement it is moved along till it meets the hard resistance of the inner wall of the sac. If there be resistance, as shown by wrinkling of the skin about the canaliculus the probe is withdrawn a little and then moved forward in a slightly different direction, a maneuver which may need repeating many times before a tight stricture be safely passed. Care must be exercised not to push the probe through the canal wall at the side, rather than through the stricture. In this manner, by using one probe after another, the stricture may be definitely located and dilated.

If after the sac is entered it be desired to explore the duct, the handle of the probe is raised while its point is kept against the inner wall of the sac, until it has reached a vertical position, the direction of the probe being toward the wrinkle at the ala nasi, when it is moved gently but firmly downward till the floor of the nose is reached. The same care must be exercised in passing obstructions as in the canaliculus. Here also we may use probes of varied sizes and shapes, as the case may call for, in diagnosis or treatment. In no operation is gentleness and constant care more necessary than in the probing of the lachrymal passages. One must have such self-control as to wait, if failure attends the first effort, until swelling has been reduced or the exact twist of the passage ascertained. It is easy to make false passages at the entrance to the sac, at the opening of the duct, and farther down to denude the bone. It is easy to break through the lachrymal bone at the floor of the orbit and otherwise do such damage as shall make the further management of the case extremely difficult and disappointing.

Many strictures may be managed by dilatation with probes of various sizes, in addition to the treatment already described, but most of those coming to the surgeon are of such long standing as to require a division of a portion or all of one or both canaliculi. This operation is done as follows: A probe-pointed little knife as Weber's or Agnew's is taken in the hand as was the probe, the patient and operator occupying the same positions. The lid is placed upon stretch in the same manner and made to enter the puncta as was the probe. The edge of the knife is turned slightly inward so that the incision shall lie in contact with the eyeball in the lachrymal lake, and then pushed inward, as was the probe, to the hard inner wall of the sac. The knife is now lifted to a position more or less near the vertical position, and as is called for by the amount of the canaliculus, desired to be divided, it is then drawn outward cutting through the thin wall of the passage. If it is desired to divide the stricture at the neck of the sac or within the duct, the knife is raised to a vertical position, as was the probe, and guided into the duct and pushed through the stricture. If freer division is called for the blade is withdrawn a little, turned partially about and again moved through the obstruction.

The probes employed for dilating lachrymal strictures are numerous. The first were introduced by Bowman, and they still retain their hold upon the profession; for general uses they have never been excelled. They range in size from 1 to 8, are made of silver sufficiently stiff to retain any given form, and malleable enough to admit of being molded into the form of the canal under treatment. Williams introduced bulb-pointed, flexible-shank probes, adapted to feeling their way about obstructions whose exact location is undetermined, with pleasing facility. Their sizes have the same range as those of Bowman. Other probes, as those of Theobald, are of sizes reaching to that of the bony canal, or as Weber's conical, the end of the cone being at the point, so that many sized probes are united in one. While I have used every variety, the ones best suited to ordinary cases are the Bowman and Williams probes.

To keep open dilated strictures, styles are used. They are left in place constantly, except at the time of cleansing or altering the size. They are introduced as probes and of such length that the tip may be at the floor of the nares and the head just outside the sac, with such enlargement as admits of easy grasping for removal. Silver and lead are favorite materials, as these metals are little acted upon by the secretions. It has seemed to me that their use was much like the treatment of urethral stricture by the constant wearing of sounds. In place of these styles, if unable to keep the patient under observation, I teach him or some of his family to pass the probe.

Cases of mucocele or dacro-cystitis are treated by opening the lachrymal passages by operation, keeping them dilated by probes, promoting their nutritive activities by means already described, and treating the constitutional diseases with which they are associated. If it be impossible, in case of lachrymal phlegmon, to enter the sac through the canaliculi, it is best to open it between them. Even cases of lachrymal fistula recover by means already described. It is granted that cases of excessive destruction of the mucous membrane lining the canals furnish little hope of securing a permeable smooth passage, with an elastic sac. Yet one is often agreeably surprised by the excellent results of most unpromising cases.

If permanent occlusion of the duct occurs, from unremovable conditions, and the suffering of the patient demands, the sac may be destroyed, or the lachrymal gland removed, or both. It has never been my fortune to meet a case calling for such operations. In no case should the constitutional condition of the patient be overlooked. In syphilis specific treatment cures many cases without operations. In cases of

gout or gouty rheumatism, local treatment without constitutional, is unsatisfactory. In cases of infectious disease, the general treatment will not be forgotten.

In general it may be said that if treated in the early stages disorders of the lachrymal apparatus result satisfactorily; if later, the chances of satisfactory results rapidly diminish, and at the last some are failures in spite of the best directed medical and surgical skill. Illustrative of certain types of lachrymal diseases are the following brief abstracts of cases:

N. H. aged 6 years, on recovering from scarlet fever was attacked with inflammation of the left lachrymal sac and surrounding cellular tissue. The tears constantly discharged themselves on the cheek. The pain was intense. The swelling when first seen, was as large as a small egg and exquisitely tender, red and hot. The mother said that the tears began to overflow soon after the onset of the fever and had rapidly grown worse. Under chloroform the sac was opened, through the lower canaliculus and the pus evacuated, the cavity cleansed with a warm solution of boric acid, and poultices applied when the hot water could not be used. The relief to the child was prompt and the treatment soothing. In about four weeks the swelling had entirely disappeared and the lachrymal passages pervious.

General R., aged 68 years, sought relief from an annoying epiphora of the right eye of long standing. Mucus and pus escaped with the tears, causing an inflammation of the cheek, blurred vision, etc. He was an old sufferer from rheumatic gout. Strictures were found at the junction of the canaliculus with the sac, at the entrance of the duct into the sac and at its lower extremity, and much bare bone between. There was considerable bare bone at the inner and upper portion of the external meatus of the right ear, showing that the constitutional disease was not limited to the lachrymal duct. The canaliculi, both upper and lower, were divided to the sac with the strictures therein, and at the same time the strictures of the duct. The passages were kept open with suitable probes, and as aseptic as possible by measures described, and the local and general nutrition promoted by exercise, diet and mineral baths. The recovery was perfect in about eight months, the bare bone having become entirely covered with a smooth membrane.

Mrs. F. P., aged 25 years, had suffered from red weeping eyes many years, rendered much worse by exposure to wind, cold or any irritant. Examination showed half a diopter of hyperopic astigmatism with the rule in each eye. This was corrected, the patient directed to soak her eyes in hot water for ten minutes, each eye three times daily, and to irrigate the lachrymal passages with a saturated solution of boric acid after each soaking. In two months the patient reported complete recovery.

Mr. J. B., aged 35 years, desired relief from a watering and stickiness of the right eye. The lachrymal sac was found moderately dilated, so that pressure upon it caused a flow of its contents from the puncta and into the nares. Examination revealed a stricture at the junction of the canaliculi and duct with the sac. These were divided and treated by dilatation, with perfect recovery in four months, the sac having fully regained its elasticity, an essential condition of a good result, because the mechanism of the passage of tears through the passages depends very largely upon that elasticity.

Mr. S., aged 28 years, a molder, was attacked by lachrymal obstruction in the tertiary stage of syphilis. The progress from simple epiphora to mucocele and dacrocystitis was very rapid. After reducing the acute inflammation, by opening and aseptic cleansing, the strictures at the junction of common canaliculus with the sac and at the opening of the duct were divided. Bare bone was found throughout most of the duct. He was placed upon large and cumulative doses of iodid of potassium, and the passages kept as aseptic as possible and fully dilated by probes. Recovery was complete in about a year, the passages becoming lined with a smooth membrane. At first visit the necrosed turbinated bones were removed.

CONCLUSIONS.

1. Among the predisposing causes of diseases of the lachrymal passages are such defects of structure as flattening of the bony canal or other irregularities, and defects of refraction.

2. Syphilis, gout, phthisis, scrofula, or any of the infectious diseases may cause lachrymal disorder.

3. Among the local causes are conjunctivitis at the upper end of the lachrymal passage, and nasal disease at the other end, the morbid process in either instance spreading to the canal nearest.

4. The management of any case will never overlook the bearings of any constitutional disease; especially does antispecific treatment furnish gratifying results.

5. All defects of the refraction should be corrected under a mydriatic and muscular equilibrium assured.

6. Diseases of the conjunctiva and eyelids, as well as all nasal disease, should be removed.

7. The treatment of the lachrymal passages with aseptic solutions through small syringes, or the forced washing by Gould's method, and the systematic external use of hot water, contribute to better results in all forms of these disorders.

8. The puncta should be rendered pervious, and their position against the eyeball assured by local treatment if possible or, this failing, by operation, so that the ends of the canaliculi may be fully within the lachrymal lake.

9. Strictures should be located by probes and either dilated or divided by instruments, the extent of the operations depending upon the nature of each special case.

10. Cases treated early in the disease give uniformly good results; those attended with large destruction of tissue are less hopeful, the epiphora often remaining in spite of treatment, but they are protected against the danger of future attacks of dacryocystitis.

103 Cass Street.

THE MORBID ANATOMIC EVIDENCES OF THE LYMPHATIC CONSTITUTION IN IDIOPATHIC EPILEPSY.

Remarks accompanying a demonstration of specimens before the Chicago Pathological Society at its annual meeting, May 9, 1898.

BY A. P. OHLMACHER, M.D.,

Director of the Pathological Laboratory of the Ohio Hospital for Epileptics.

GALLIPOLIS, OHIO.

This opportunity of demonstrating before the Chicago Pathological Society a series of specimens illustrating some recent studies upon the morbid anatomy of epilepsy is one for which I am grateful, and it is a pleasure to thank my friend, Dr. Hektoen, and his associate, Dr. Le Count, for their kindness in according me the privilege of bringing to your notice a subject in which I am intensely interested, and one which since it involves the intelligent examination of gross pathologic objects, seems especially adapted for presentation before a society composed of experienced pathologists. Not to overstep the bounds of propriety incident to this particular meeting I shall endeavor to condense as much as possible what seems necessary to say in explanation of the objects submitted to your inspection.

In the course of an investigation into the pathology of epilepsy, carried on since last July at the Ohio Hospital for Epileptics, a series of uniform and hitherto undescribed conditions have been found at autopsy in certain cases of epilepsy, and it is to these particular conditions that your attention is respectfully invited.

It is scarcely necessary to remind you that no constant gross or microscopic lesion has been discovered in epilepsy, especially in what we might style "pure

epilepsy, or "primary" epilepsy, or idiopathic *grand mal*. This may, in part at least, be due to the fact that attention has too exclusively been concentrated upon the central nervous system to the neglect of the body as a whole, and that too much weight has been laid upon changes in the brain which are doubtless of a secondary character, due to the action of some extrinsic cause. This poverty as regards somatic details will be fully appreciated by anyone who searches the literature of epilepsy with the desire of obtaining postmortem records in which the data has been determined with that exactness and fulness demanded by modern pathologic research.

It was precisely this condition of affairs that led us, on commencing our work, to look with especial care to the gross and microscopic pathology of the cases which came to autopsy, in the hope that the data carefully gathered and reliably recorded would ultimately furnish statistics from which conclusions could be drawn; and that eventually there might be established what has always been lacking as a foundation for the study of epilepsy, and what is fundamental for the rational study of any disease, viz.: a morbid anatomy.

Eighteen cases have been examined postmortem since this work was inaugurated, and in eight of these cases some distinctive features were met, which, from their comparative constancy and singularity were regarded as more than accidental occurrences. These eighteen cases represented various types of epilepsy and the insanities accompanied by epileptoid phenomena. The findings at autopsy naturally varied widely in these cases, as would be expected from their clinical diversity. The details with reference to the first six of them were recorded in the *Bulletin* issued by the hospital last January; and in another publication, to be ready in a short time, the full account of the eighteen cases will be given.

So far as the clinical side is concerned it is important to note that these eight cases include all of the examples of typic idiopathic *grand mal* which have thus far been examined at postmortem. The patients were all young adults, varying in age from 17 to 35 years. All of them, except one, suffered with epilepsy from childhood. Four of them had periodic epileptic mania. One man died from maniacal exhaustion; one committed suicide; two women and one man were found dead in bed after having retired in apparent good health, which is to say (and this should be emphasized), that out of the eight cases there were three instances of sudden death, in at least two of which no lesion to account for the abrupt ending could be found.

The gross pathologic anomalies in these eight cases, which are illustrated by the specimens to be submitted for your examination, may be summarized as follows: A persistent, enlarged, and apparently active thymus body; a pronounced hyperplasia of the intestinal and splenic lymph-follicles; a more or less marked hypertrophy of the lymphatic glands, and of the lymph-adenoid follicles of the the tongue, larynx, trachea, esophagus, tonsils, and even of the stomach; a narrowing of the arteries; an abundant development of fat; an enlargement of the thyroid; and certain osseous changes indicative of old rickets. Not all of these abnormalities were present in a single case, though the persistent thymus, with one or more features added, was constant. With the specimens before you it will not be necessary to enter into minutiæ of description since you will readily recognize the thymic body, the enlarged follicles, narrow arteries, etc.

Taken collectively, these morbid anatomic conditions make a picture of what the German pathologists style the "lymphatic constitution." The evidences of the lymphatic constitution have been noted for a number of years in connection with several diseases, but never, so far as I can determine, have they been described in connection with epilepsy.

There are two morbid conditions, accompanied by a more or less perfect picture of the lymphatic constitution, which seem especially important in relation to what we have found in our epileptics. One of them is laryngismus stridulus, or more exactly, what the Germans style "thymic asthma," which is well known clinically, and which is often responsible for very sudden death in the infants affected. The other condition is sudden death in apparently healthy adults with no assignable lesion, and in whom only the persistent thymus, with other evidences of the lymphatic constitution, is found at autopsy. It is impossible to discuss these extremely interesting morbid states in the time at our disposal, and it must be sufficient simply to emphasize the fact that the morbid anatomy of the lymphatic constitution is peculiar, not only to these conditions, but, apparently also, to at least certain cases of idiopathic epilepsy. Of this morphologic analogy there can be little doubt, and in the report upon four of our cases in the January *Bulletin*, arguments were advanced for defining a clinical as well as anatomic analogy between thymic asthma, thymic sudden death, and epilepsy.

What the significance of the lymphatic constitution is, in its relation to thymic sudden death, is not at all clear, although numerous hypotheses have been called into account; and this is precisely the case in relation to our own work where this peculiar anatomic picture has been shown to occur in certain epileptics. Without resorting to pure speculation the present state of our knowledge in relation to the lymphatic constitution prohibits an explanation, and since speculation has played too exclusive a part in the attempts to account for that mysterious malady, epilepsy, we propose to refrain from indulging in this very tempting pastime.

With this naturally very much condensed introduction, which will, I trust, make them more intelligible, I beg to submit the specimens which illustrate the persistent and hyperplastic thymus; the intestinal and splenic lymphatic hyperplasia; the narrow arteries; the hypertrophied lymphatic glands; and the excessive development of fat; which were obtained from three of the eight epileptics, all of whom presented the typic picture of the lymphatic constitution at autopsy.

CEREBRAL SYPHILIS AND SOME OF ITS MENTAL ASPECTS.

BY ARTHUR E. MINK, M.D.

Professor Mental and Nervous Diseases, College of Physicians and Surgeons; Neurologist to the Baptist and Woman's Hospitals; Clinical Lecturer on Neurology, City Hospital; Formerly Physician to the New York City and King's County Insane Asylums.

ST. LOUIS, MO.

The complicated manifestations of brain syphilis, when given their proper interpretation, are of the utmost value to the student of scientific medicine.

Nature, working in her own laboratory with its marvelously delicate adjustments and contrivances, is continually performing a series of brain experiments which infinitely surpass those performed by man with his crude and clumsy technique.

The syphilitic neoplasms are of such an ephemeral character, coming and going, here today and there tomorrow; that they frequently give us the opportunity to study in one and the same case all of the kaleidoscopic and complicating phenomena of focal and diffuse, destroying or discharging lesions, present simultaneously or successively. It is just this lack of order, this protean appearance and disappearance, which is characteristic of the phenomena of cerebral syphilis. So we may meet with cases which up to a certain time have shown signs of focal involvement only, and then develop suddenly symptoms of syphilitic melancholia, hallucinatory insanity or dementia; or, on the other hand, we may meet with cases which have shown for a long time only the mental phases of cerebral syphilis, suddenly develop hemiplegia and ataxic aphasia in an apoplectiform attack. Again, we meet with cases in which the history and examination show the presence of focal and diffuse, destroying and discharging lesions side by side and complicating each other. The lesions of cerebral syphilis are either osteal, meningeal or cerebral, but only those tissues of mesoblastic origin are involved *per se* by the luetic process.

When the bones of the cranium are affected, we either find a simple sclerotic or gummatous periostitis. There may be a gummatous osteomyelitis and the inflammatory atrophy of Virchow (caries sicca). When the dura is involved we have to deal with a pachymeningitis externa or interna combined with a gummatous meningitis. The gummata occupy by preference the processes of the dura. More usually gummata are found in the subarachnoideal space. They are whitish-red, grayish or grayish-red masses. They are diffused or circumscribed, but are never sharply demarcated from the neighboring brain substance, which is usually in a state of white or red softening. They undergo caseation from the center to the periphery, slowly becoming changed into yellowish masses. On the convexity of the brain they cause adherence of the meninges to each other and to the softened brain tissue. At the base adhesions are rarer, and usually instead of gummata we find a gelatinous grayish exudate, similar in extent and appearance to that of a tuberculous meningitis. If the syphilomatous mass is absorbed there is left a thickened cicatrix. It is rarely or never that we find gummata in the brain substance proper without any anatomic connection with the meninges. We often meet with diffuse encephalitis, more particularly of the cerebral cortex.

One of the most important lesions of cerebral syphilis, one that does most damage to the circulation and nutrition of the brain, is that form of endarteritis first described by Huebner, which involves largely the endothelium of the interna along with an exudate of leucocytes from the vasa nutritia, which together form a new growth, ultimately obliterating the lumen of the vessel affected. Those of the base are usually involved and especially the arteries of the fossa of Sylvius and corpus callosum. Softenings are naturally produced in the areas supplied by these obliterated arteries. This more particularly is found in the nucleus lenticularis and caudatus. The cranial nerves are also often affected through the shrinking of basilar exudates.

It is claimed by some authors that no definite lesions can be found postmortem in some cases of cerebral syphilis. There may be some truth in this and we think it is especially so of those cases of brain disturbance which sometimes occur in the earlier stages of the disease. The writer recalls two cases of syphilitic coma occurring before and during the first cutaneous manifestations, which can only be explained by assuming the presence of cerebral intoxication, due to intensity of infection. Broadly speaking, we can say that that there is a certain relation between the location of the lesions and the resultant symptoms produced by them. So can a gummatous lepto- or pachy-meningitis produce symptoms of cortical irritation, especially of epilepsy, often accompanied by mental disturbance. Occlusion of the larger arteries often produces the characteristic symptoms of syphilitic coma or symptoms due to thrombotic ischemia of cortical or subcortical areas, such as brachial or crural monoplegia, facial palsy, amnesic or ataxic aphasia, etc.

A gummatous basilar meningitis gives us an interesting mixture of cranial nerve palsies, accompanied by hemiplegia. Alternating hemiplegia of the ocular type accompanied by ptosis is very common in basilar syphilis. In fact, ocular palsies are so common in cerebral syphilis that Ricord used to say: "*Un paralysie oculaire c'est en quelque sorte la signature de la vérole sur l'œuil d'un malade.*" Many endeavors have been made to properly classify the syndromes characteristic of brain syphilis. Huebner in his classic article, divides them into the following forms: Psychical disturbances with epilepsy, incomplete paralyses (seldom of the cranial nerves) and a final comatose condition of short duration; genuine apoplectic attacks with succeeding hemiplegia, in connection with peculiar somnolent condition occurring in often repeated periods and generally at the same time paralyses of the cerebral nerves. Lastly, he distinguishes forms with a course similar to that of paretic dementia.

Fournier distinguishes six different forms: 1, the cephalalgic; 2, the congestive; 3, the epileptic; 4, the aphasic; 5, the mental; 6, the paralytic. These classifications have both performed splendid service in the study of cerebral syphilis; but we believe that cerebral patholgy has advanced sufficiently to show the relations between certain definite lesions, their location and extent and the symptoms produced by them. So we adopt the following classification: 1. Syphilis of the base. 2. Syphilis of the vertex. 3. Syphilitic endarteritis, which can be either basilar or vertical in situation. 4. Mixed forms, being both basilar and vertical in location and consisting usually of both specific endarteritis and meningitis. 5. Meningo-encephalitis corticalis syphilitica. There are certain general symptoms common to nearly all varieties of brain syphilis. Headache, especially in the earlier stages, is one of them. It is dull and diffuse and is worse at night in some cases. Sometimes it is referred to the vault, at others to the base of the cranium. This is soon followed by insomnia, doubtless due to the continued pain. Vertigo develops in many cases and may be complicated with nausea and vomiting. These patients are morose and irritable. In cases where a syphilitic endarteritis predominates, the patient is just in the opposite condition. He is

drowsy or even stuporous, going to bed early and staying late; those working at sedentary occupations falling asleep at their work. In some cases this state deepens into a veritable coma (Buzzard's syphilitic coma) where the patient can only be aroused by energetic shaking, answers a few questions in monosyllables and on being left alone sinks again into a deep stupor. In some cases the patient is unable to attend to the most pressing demands of nature, such as micturition, defecation, etc. The countenance of the patient often shows a stupid or expressionless aspect, owing to the obliteration of the characteristic lines of facial expression. In many cases of cerebral syphilis we have found pronounced cardiac and gastro-intestinal irritability and a condition of vasomotor paresis of the cutaneous arterioles. These were especially pronounced in cases where there were signs of cortical involvement.

It is known that gummatous meningitis more frequently involves the base than any other part of the brain. The gelatinous exudate is more frequent about the optic chiasm, the interpeduncular space, pons and oblongata, obscuring and enveloping cranial nerve roots. They become infiltrated with the exudate and often the vessels supplying their nuclei become affected, thus producing a thrombosis and softening of them. The cranial nerve palsies of brain syphilis are numerous, but the optic and ocular nerves are especially involved. It is therefore common to meet with ptosis, unequal pupils, strabismus, etc., as a result of the involvement of the third nerve. Involvement of the optic nerves produces contractions and irregularities of the visual field.

There may be a bi-temporal hemianopsia due to involvement of the chiasm, or a lateral or homonymous hemianopsia may be present. In 100 cases of brain syphilis, Uhthoff found the oculomotor involved 34 times, the abducens 16 times, the patheticus 5 times and the trigeminus 14 times. Pupillary disturbances are found, such as the Argyll-Robertson pupil, loss of both light and convergence reflex and the hemiopic pupillary reaction Optic neuritis of the acute type is often present. Blindness is present in some cases due to excessive pressure upon the optic tract. Neuralgic pains are met with in the trigeminus area or anesthesia or hyperesthesia may possibly occur.

Loss of smell or hallucinations of smell, and loss of taste or hallucinations of taste, occur from pressure upon the olfactory or gustatory nerves, or irritation of their cortical areas by pressure of the specific exudate, at the base. Facial palsy may result from involvement of the facial nerve. Deafness rarely occurs from affection of the auditorius. The roots of the eighth pair of Willis are involved in some rare cases. In many of the mixed cases there are symptoms of involvement of the arteries of the base, due to a concomitant syphilitic endarteritis, especially of those arteries supplying the basal ganglia, the internal capsule, the motor areas, etc. These symptoms are most usually due to thrombosis. The symptoms are very sudden, the hemiplegias and monoplegias developing slowly without loss of consciousness. Another characteristic of palsies of this kind is their ephemeral character, coming and going as the thrombosis caused by the syphilitic endarteritis increases or diminishes. The hemiplegia of syphilis is usually accompanied by oculomotor palsy of the opposite side. The palsies do not occur simultaneously; when they do the presumption is in favor of a non-specific palsy due to a peduncular hemorrhage. The presumption is usually in favor of syphilis when one attack of hemiplegia is followed by another of the opposite side.

Amnesic and ataxic aphasia are often a complication in these cases, and may be due to either arterial thrombosis or gummata in the sensory or motor speech areas. The same may be said of ataxia or agraphia. Symptoms pertaining to the pons or medulla are often due to involvement of the basilar and vertebral arteries. In syphilis of the vertex we have symptoms which are the result of cortical irritation and showing themselves as attacks of Jacksonian epilepsy. Focal symptoms due to involvement of sensory areas, are occasionally met with. An helter-skelter collection of symptoms pointing to other local or diffuse, destroying or discharging lesions of the cerebral cortex, is often met with in cases of this type. The epileptic attacks are often followed by a paresis of a leg or arm or one-half of the body. Aphasia both of the sensory or motor types or types of bradyaphasia are of frequent occurrence in syphilis of the convexity. In many cases the epilepsy resembles the idiopathic type and simulates the types of grand and petit mal. Another peculiarity characteristic of syphilitic epilepsy is that it suddenly breaks out after middle life and so, as Fournier says, when a patient past thirty years of age suddenly develops epilepsy, it is ninety-nine chances out of a hundred that it is due to syphilis. *Appliquons-nous à demasquer l'epilepsie syphilitique, à peine sera-t-elle connue qu'elle sera guérie*, says Yvaren, and there is no truer saying in medical science.

This class of patients are often morose or irritable or even pronouncedly melancholic. They are, in my experience, the only syphilitics who become maniacal. In some cases we have to deal with a marked disturbance of ideation, apperception and memory. The patients sometimes seem to have their volition impaired, suffering in a marked degree from abulia. When these cases are untreated or improperly treated, the fits increase in number, consciousness becomes more and more beclouded until the patient becomes comatose, involuntarily evacuating urine and feces, respiration and pulse becoming more and more feeble until finally death ensues. In this form of brain syphilis as in many others, we frequently find polydipsia, polyphagia, mellituria and even hemoglobinuria. These last symptoms point to involvement of the bulb. Nearly all cases of cerebral syphilis are accompanied by morbid mental phenomena. The patient may merely have a morbid fear of syphilis or he may become a chronic hypochondriac and imagine that he is afflicted with a new disease every day. The psychoses of weakness or depression are the characteristic mental symptoms in these maladies. Stuporous dementia or hallucinatory confusion are often found in the earlier stages of cerebral syphilis. In the last mentioned variety hallucinations of hearing and sight are especially prominent, particularly the former. The patient may imagine that he hears his neighbors and the public in general speaking about his disease, saying that he is rotten, that he should be shot, drowned or hung. He imagines that on this account he is worthless, that he should be done away with or that his family are conspiring to do so. In some of my cases auditory hallucinations have been among the most persistent and intractable symptoms. In many cases patients who were formerly very neat and tidy became very slovenly and filthy in their attire and

extremely neglectful of all their personal interests. In some of my cases I have also noticed a peculiar weak and bleating tone of voice.

One of the most characteristic cerebral affections of syphilis is a diffuse disease of the cerebral cortex due to a meningo-encephalitis, the so-called syphilitic dementia. That is to say that most cases are due to this definite pathologic condition. Nevertheless, a basilar gummatous meningitis or luetic endarteritis can undoubtedly produce the same symptoms by constricting or occluding the cortical arteries and so producing a diffuse nutritive famine in the areas supplied by them.

Focal and diffuse symptoms are often inextricably mixed. The patient may have transitory attacks of facial, brachial or crural palsy mixed with motor or sensory aphasia, agraphia, alexia or word blindness, and all of these may come or go in a random way. With these are mingled amnesia, abulia, impairment of association and lack of apperception. Somnolence is often present combined with nocturnal headache, made worse by pressure on the skull. Vertigo too is often present. The patient's capacity for exertion is reduced. He is morose and irritable. His face has a stupid and expressionless aspect. He becomes more and more melancholic and soon develops delusions of suspicion, imagining that every one knows and talks about his disease. In some cases suicidal mania develops. Hallucinations of hearing, taste and smell are pronounced. In the writer's experience delusions of grandeur, such as we find in paretic dementia, are pronouncedly absent in syphilitic dementia. Another characteristic is what Erlenmeyer terms the partiality of the defects. Musicians lose their nicety of touch, bookkeepers their power of calculating and artisans their deftness. Only certain mental functions are harmed and others left intact. One of my patients lost his fluency in a foreign language, and his memory for recent events and his volition were slightly impaired. As in nearly all forms of brain syphilis, the disease progresses by jumps, symptoms appearing and disappearing and mixing with new ones. Pathognomonic of brain syphilis is its course, especially in this form, the disease progressing by jumps. Intermissions occur in which the patient is in a state of comparative health or improvement.

Ocular palsies are frequent in many cases, as well as the Argyll-Robertson pupil, mydriasis, myosis, ptosis, etc. We may have amblyopia, optic neuritis, etc. Apoplectiform and epileptiform attacks are common. The delusions from which the patient suffers are unsystematized and the disease frequently simulates the phenomena of paretic dementia, for which it is often mistaken by incompetent diagnosticians. It can easily be distinguished, however, from paresis by the absence of delusions of grandeur and by the presence of numerous focal symptoms occurring in random order. The following phenomena are peculiar to both focal and diffuse forms of cerebral syphilis: 1, sudden shifting of symptoms; 2, the predominance of cranial nerve palsies; 3, the multiplicity of palsies along with their coming and going; 4, the loss of particular accomplishments; 5, the concomitant appearance of symptoms due to destroying lesions of various cortical areas, *e. g.*, left hemiplegia with aphasia or brachial or crural monoplegias, etc.; 6, the sudden coming or going of apparently fatal symptoms such as coma, followed by perfectly lucid states; 7, the comparatively rapid termination in dementia. In the treatment of brain syphilis there are only two sheet anchors: mercury and the iodids. The writer uses mercury in the form of an inunction, rubbing in from one-half to one dram daily for a period of about three weeks. I intermit this treatment when salivation appears, which can be greatly retarded by carefully cleansing the teeth every three hours. I no longer torture my patients by giving them the ordinary iodids of potassium or sodium, for I have never yet seen a single patient who could tolerate the enormous doses of these salts which we find necessary to give in cases of nervous syphilis. I find their administration to be followed by great anorexia, headache, malaise, diarrhea, coryza, cutaneous eruptions, etc.

But the iodids are necessary in some form, owing to their destructive action upon luetic exudates and their stimulating action upon the lymphatic and glandular systems. So, for the last three years I have been using, with most gratifying results, the excellent syrup of hydriodic acid made by Mr. R. W. Gardner of New York.

There is no preparation more widely substituted than this by unscrupulous druggists, but in my experience no other preparation has had the same beneficial results. It agrees well with the stomach and can be given before meals, when it can best be absorbed. It can be continued for a long time without producing symptoms of iodism and yet is just as efficacious as the salts of sodium, potassium, etc. Robust patients I am in the habit of putting upon a spare diet in order to facilitate destructive tissue change. I also have them drink plenty of water and take a hot air or water bath in order to increase the excretory functions of the skin and kidneys. Anemic or weak patients are to have a plain but nutritious diet. The use of inunctions should only be resumed at the end of two or three weeks after the appearance of stomatitis. The syrup of hydriodic acid I give continuously. After a certain length of time I give the patient a tonic course of iron, strychnin, arsenic, quinin, cod-liver oil and hypophosphites and mercauro. Half-way measures are of no avail in the treatment of brain syphilis. Yvaren has well said that our treatment must be as energetic as the disease. The physician should first make sure of his diagnosis, then map out his line of treatment and stick to it with bull-dog pertinacity. Pursued in such a manner as this, no disease can give more gratifying results in its treatment, than brain syphilis.

TREATMENT OF URETHRAL STRICTURE.

BY FREDERICK LEUSMAN, M.D.

CHICAGO, ILL.

It is not here intended to speak of the expedients and methods called for by cases of emergency rendered singular by the rarity of their occurrence as well as their complications. For all practical purposes we have three accepted forms of treatment: Dilatation, electrolysis and urethrotomy.

True, we have an Oberlaender, who with a dilator that bears his name dilates the urethra and controls the effect of this procedure with the endoscope, and we have a Tuttle with a dilator of his own. There is the famous Guyon, who, with a syringe named after him, and an elongated nozzle, injects medicines into areas assumed to be the seat and cause of the disease. More workers with methods and appliances might be mentioned, bound to give some returns in the hands

of a thoughtful, skilled surgeon, ably seconded by an obedient patient. But correctly or incorrectly, while these gentlemen are justly classified as authorities in their chosen lines, their practice finds few imitators in the profession, as a whole, either in hospitals, clinics or private practice.

It is curious to retrospectively view some of the remedies and modes used in days gone by, such as slippery-elm tents, horsehair, hydrostatic dilatation, quadrangular sounds, Holt's divulsor, cauterization with potassa fusa.

Henry Thompson narrates an instance in which a surgeon passed a caustic 486 times during six years, seconded by the daily introduction of a bougie, which was left *in situ* for half an hour. The patient, so it was claimed, continued free from relapse. Another case required twenty-two years for cure. E. Home published a case where a caustic had been applied 1258 times. Honor be due to both surgeon and patient. Thielman[1] recommends the internal use of potassium iodid.

Even in these days many efforts are made to cure organic stricture and its attendant symptom, gleet, with internal remedies, injections, gelatin bougies and other hobgoblins too numerous to name. The patient must swallow sandalwood oil, copaiba balsam and other drugs that furnish but little palliation, and certainly no cure, but irretrievably damage the tender cells of the uriniferous tubes in his kidney, and the no less delicate cells of the mucosa lining his stomach. When at last the stomach or kidneys rebel, injections are ordered for a change. That in the nature of things also failing, a small sound is passed, also with no relief, until the patient tires and goes from doctor to doctor, with some kaleidoscopic changes but no cure. Even the bacteriologist, armed with centrifuge, immersion-lens, culture-tube, rabbits and the authority that a position in the laboratory apparently conveys, is unable to draw valuable or practical conclusions by means of his scientific paraphernalia. The patient leaves the bacteriologist entertained and edified but not cured. W. Bruce Clark[2] says: "If we would gain a clear knowledge of the best methods of treatment, we must extend our knowledge of pathology from the museum spirit to the human flesh, which is more than ever possible today by the aid of the urethroscope and cystoscope. What up to quite recently has been a matter of supposition and inference is today often visible to personal inspection. Once a stricture, always a stricture, represents the views of twenty years ago. Rectal strictures of a fibrous nature certainly yield to free division, accompanied by persistent dilatation subsequently, and if large bougies are used for a year, at first daily for ten minutes, and after a few months less often, the stricture disappears and shows no tendency to return, a fact which I have been able to verify on several occasions." The idea that strictures can be cauterized away by means of potassa fusa, etc., is happily antiquated. The benefit occasionally received from such treatment must be attributed to removal of tender spots and the incidental dilatation. The man who treats gleet with injections finds his congener in the man who treats nasal catarrh with washes and sprays only.

Before proceeding to local treatment we must appreciate the necessity to arrive at a thorough understanding of all underlying causes so as to be enabled to direct the hygienic, dietetic, moral and constitutional treatment accordingly. Be on the lookout for complications, and bear in mind the ever-present enemies such as syphilis, tuberculosis, uric acid diathesis, polypi, granulations, in brief, make a wide-gauge diagnosis. Life is too short, opportunities too limited, cases too varied to allow any one man to speak the last word as to what method is the best in a general way. Probably in the nature of things there is no such generally successful and always applicable procedure. The individuality of the patient, as well as his attendant, will reassert itself. Some patients will submit to anything rather than the knife; some medical gentlemen entertain an equally wholesome horror for the keen edge of the blade, while again we meet with the resolute patient who is tired of compromises, and the resolute surgeon with confidence in his art, who will cut the stricture. Besides, other considerations frequently enter, which in practical life sweep away all theories and opinions of even the authorities. The very interpretation of the case, the diagnosis, whether or not certain symptoms result from a stricture or not, will frequently be ushered in only after prolonged labor pains. It has been perhaps justly claimed that all the good that ever came out of any of these means is mostly due to the incidental dilatation. The therapeutic or remedial effects of the passage of the sound may be classified as follows:

"1. The allaying of urethral hyperesthesia.

"2. The restoration of the urethral canal to its normal caliber and the absorption of inflammatory products.

"3. By expressing the contents of the suppurating urethral glands and lacunæ, it exerts a curative influence."[3]

Almost all modern authors agree on the value of dilatation and the ease of its application. In accordance with their teachings the large majority of surgeons and physicians in their daily practice dilate their patients' strictures, unless the strictures give rise to difficulty in urination, when, other conditions permitting, the surgeon will cut and the physician still get along with filiform bougies, aspiration, continuous dilatation, rest, heat and baths, eventually bringing his patient's stricture to a caliber that will admit metallic sounds. I will pass over Guyon's irrigations, endoscopic applications and examinations, for they come into play only in the absence of stricture, and in the presence of stricture only when stenosis is complicated by granulations, polypus, chronic localized catarrhal conditions and ulcers that will not yield to the use of the knife and sound.

Strictures that are not organized beyond all hope of resorption will frequently be cured by intelligent and patient efforts at sounding. To do that effectually requires in many cases meatotomy. This little operation I have found has difficulties of its own. We must cut enough, but beware of over-cutting and remain in the center, cutting a part and relying on the bougie *à boule* to tell us whether to stop or continue seems the safest way. Hemorrhage out of all proportion to the operation is apt to occur primarily or secondarily for a week or more after. The insertion of horsehair sutures for the approximation of the urethral mucosa to that of the glans has been recommended as a preventive measure of this very annoying complication. There is a general agreement that sounding should not be repeated till all the

[1] Med. Ztg. Russlands, St. Petersburg, 1857, xiv, 51.

[2] London Lancet, iv, 137-149.

[3] Stewart: Diseases of the Urethra.

reaction caused by their use has disappeared. The interval will thus vary from three to five or seven or more days, depending on the character of the case and rapidity of increase in the size of the sound used. The length of time that the sound should be allowed to remain will also vary with this modification, that the oftener sounding seems advisable the less time should they be permitted to remain within the urethra. When sounding is done at less frequent intervals, every two to four weeks or so, ten to fifteen minutes duration has proved in the writer's experience not to be any too long a time. It is axiomatic to always remove the sound when the pain attendant upon its introduction in place of dying away increases in severity. Extreme distention long enough applied, frequently repeated, results in a thinning out of these fibrous bands and finally snaps them to pieces, when they are ultimately absorbed. That this result frequently happens and follows the exertions of a conscientious physician assisted by a faithful patient, there can be no doubt. The clinical result is meant, and not the microscopico-anatomic one that the pathologic anatomist will bring before our vision in instructive serial sections. Surgery even of the mildest kind, such as sounding, causes cicatrices of its own. Surgery can not be done without cicatrix formation; still surgery in modern times furnishes the greatest clinical results. Thus if success attends our efforts at dilatation, if the stricture is gradually melting away, if the symptoms disappear, if recontraction, even after putting intervals of months between the soundings, does not take place, then the physician can claim a cure, and such cures must be frequently obtained if we believe the testimony of the great surgical writers of the day. But if in the presence of a well organized stricture the patient is not willing to put in a year or five years' sounding as an experiment as to whether this mode of treatment will cure or not; if, further, in the judgment of the surgeon the case seems one unsuitable for sounding alone; if time is an object and the most rapid way, most promising in results is sought after; if the patient is willing to be treated for one year only, but not ready to carry his sound in his portmanteau and thus carry on treatment to the time of his grave; if the surgeon is aware that a bladder is better off without life-long instrumentation with its dangers of vesical and renal infection; if, further, the patient has been sounded by a half dozen physicians with no relief from symptoms, then under such and other conditions it becomes our duty to cut; by cutting the ring or rings of fibrous tissue at one point we can now introduce properly-sized sounds, reach extreme dilatation, get absorption and produce a clinical cure. Otis' urethrotome in narrow-caliber cases, preceded by Maissoneuve's instrument, is the best and last device in the progress of evolution. It is a combination of dilatation, divulsion and cutting. The difficulty of properly cutting a stricture, of dividing the last fibers, will be realized when you test your case ten days later with a bulbous sound of proper size and find a stricture where everything appeared free after cutting ten days before. If stricture in such cases be still present, it must be cut again (Otis): you must follow strictured fibers as relentlessly as infection in carcinoma or tuberculosis.

Sounding after cutting has to be maintained for one year, once or twice a week in the beginning, and in the end the interval is lengthened to once a month. The patient must be informed before submission to the operation that he has to remain under your care for one year, or else his second condition will be worse than his first. But if he be a man determined to get rid of a filthy, ennervating affection, he will gladly submit to one year's treatment. He is then done with sounding and troubles referable to that part of his economy. With aseptic care there is no danger from cutting; no danger at all compared to the dangers incidental to the presence of the stricture. An annoying, but, in my experience, never dangerous feature is hemorrhage. But given a patient who follows instructions and is no hemophile, the writer has usually controlled all bleeding promptly by means of pressure applied externally and rest in bed with elevated pelvis.

Clifford Perry,[4] at the suggestion of Maisch, has successfully stanched the hemorrhage following an incision in an alveolar abscess of a bleeder by the internal administration of calcium chlorid. This was given in 1.30 gram doses every four hours, and with magic results. Sounding is begun the third or fourth day after operation, and made painless by means of cocain anesthesia. The urine is rendered non-irritating and the nervous system tranquilized by a solution of potassium citrate and bromid. The addition of secale cornutum lessens the disposition to hemorrhage. Some patients will attend to their business the next day, but it is a good rule to confine them to their bed or couch for a week or two. The average patient is able to be about in from three to seven days.

There is no question of choice between internal urethrotomy and perineal section; the latter operation is the only one suitable in strictures posterior to the anterior layer of the triangular ligament. Perineal sections should be supplemented by anterior internal urethrotomy if necessary. Abner Post remarks: "We may consider strictures as to their effect upon life and as to curability of the local lesion. A very important point in prognosis is the extent to which the kidneys have suffered, a matter by no means easy to determine in every way. Some evidence of their conditions can be gained by careful examination of the urine, noting the quantity secreted and the amount of urea and albumin, even when the amount of pus makes microscopic examination difficult. The condition of the heart ought also to be considered, as it is affected by renal disease of varied origin." E. H. Fenwick has drawn attention to the amount of residual urine in cases of stricture as of value in estimating the damage to the kidneys, by showing the amount of pressure the kidneys have been working against. It may be safely assumed that five ounces of residual urine, which is probably near the average of unreleased narrow strictures, would indicate sufficient damage to cause anxiety as to the effect of any intercurrent inflammation or disease, while an amount over ten ounces would make us cautious in operating for stricture by internal urethrotomy and in giving anything but a grave prognosis of the ultimate effects of the constriction. The behavior of the bladder in its progress in regaining the power to completely empty itself will teach us much as regards the future course of the case. It is a great advantage to perform this operation under the influence of a general anesthetic, for a number of reasons, not the least of which being the opportunity it affords of investigating the rectum and to do such rectal surgery at the same time as the exigencies of the case demand.

[4] The Journal of the Amer. Med. Association, March 13, 1897.

The treatment of electrolysis is carried out mainly by physicians of non-surgical tendencies. That it has done good in the hands of such men as Newman of New York, we can have no doubt. Failure to obtain results should be charged up, not so much to the method as to the operator. This statement applies with equal force to the cutting operation and dilatation without previous urethrotomy. We must remember that others may accomplish what we do not, and when we compare methods, we usually are experienced only in one or the other way: for the balance, we are compelled to be satisfied with reasoning *a priori*. Keyes[5] says: "I believe that a strong current is full of danger, both immediately from irritating effect and ultimately from cicatricial effect, and that employment of the negative pole does not prevent this. My study of the subject and the experience it has brought me, digested with all the impartiality I possess, led me to state that the allegation that electricity, however employed, is able to remove organic urethral stricture radically lacks the requirement of demonstration. The confidence of its advocates that it will radically cure organic fibrous stricture is, in my opinion, due to the combined credulity of the patient and imagination of the surgeon, or to some special but fortuitous act of Providence upon the co-operation of which, in the case of his own patients, the general practitioner can not with any confidence rely."

CONCLUSIONS.

1. Dilatation is the best treatment in strictures if it cures.
2. Electrolysis is a modified dilatation; it is a good treatment unless contra-indicated.
3. Cutting is the cure in non-dilatable cases, and in all strictures at or near the meatus.

100 State Street.

[5] New York Med. Jour. Oct. 6, 1888.

THE RECLASSIFICATION OF SOME ORGANIC NERVOUS DISEASES ON THE BASIS OF THE NEURON.*

[ABSTRACT.]

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY CHARLES K. MILLS, M.D.

A few neurologic writers have already spoken of organic neuronic diseases, and many views and theories, as well as a considerable terminology springing from the doctrine of the neuron have rapidly been developed.

The most important point of the present communication is to direct attention to the fact that the time has arrived for applying the theory of the neuron, or the nerve cell regarded as an anatomic unit in the classification of some of the most important organic nervous diseases, and especially many of those which have been hitherto placed under such heads as system diseases and primary degenerations.

In a general way, the diseases to which I shall chiefly refer may be classified under the three heads of *toxemias*, *inflammations* and *primary degenerations*, but more especially the last. In a fundamental sense they might probably all be classed as toxemias, since the chronic scleroses and degenerations, as well as various recognized forms of peripheral and central inflammation are primarily due to a toxic cause, using here the word toxic in its broadest sense.

Accepting the classes of toxemias, inflammations and degenerations, many of these would be better grouped as neuronal or neuronic diseases, rather than as diseases of the brain, spinal cord or of the peripheral nerves, as they have usually been designated.

Not only do toxic agents resulting in inflammations and degenerations tend to attack special systems of neurons; but not infrequently a selective tendency is exhibited as regards the sensory, the motor, the intercalary, or the association systems of neurons; and more than this, special portions of the motor, of the sensory, or of the intermediate chain of neurons are liable to be attacked in particular instances, while other portions of this particular system escape. The facts at our command are chiefly with regard to the sensory and motor projection systems, but the evidence is accumulating that in particular cases commissural, associating and storage systems may also be liable to elected system diseases.

The term "system disease" is one which has long been in use in neurology. Commonly it has been applied to those diseases of the neuraxis, and especially of the spinal cord, which attack, or are supposed to attack, exclusively certain tracts or regions of nerve fibers or nerve cells having common anatomic relations and physiologic properties. It is, however, more scientific and more helpful practically, to consider system diseases from the basis of the neuron, than to regard them as diseases of the cord or of the brain.

One point to be strongly emphasized incidentally is that the toxic agents tend primarily to attack systems of neurons as a whole, and not this or that particular part, as the cell corpus, the axon, the collaterals or terminals. It is true, however, that the destructive influence of the poisoning agent may be first exhibited, so far as can be learned by the means of investigation at our command, in one or in another portion of the nerve cell.

Dr. Spiller and the writer have recently made a study of acute ascending paralysis (Landry's paralysis), in the case of a patient who died in the wards of the Philadelphia Hospital[1]. A careful postmortem examination was made, this including not only an examination of the organs in general, and of the central nervous system, but also that of some of the motor and sensory nerves. The conclusions reached in this study are of interest in connection with the views here presented. Both the peripheral nerves and the cell bodies were the seat of extensive degeneration.

It has been held by some that in multiple neuritis it is presumable that the poison acts on the entire sensory neuron at the same time, which accords with the views of the writer that in most neuronic diseases of toxic origin the poison tends to attack the neurons elected as a whole.

The disease which has so long been known by such names as locomotor ataxia, tabes, tabes dorsalis and posterior spinal sclerosis needs, from the standpoint of the neuron, to be presented in a new pathologic light, but I can not review here the recent literature of this sub-

* The substance of this paper was read before the William Pepper Medical Society of the University of Pennsylvania, March 11, 1898; and before the Baltimore Neurological Society, April 20, 1898; and was presented to the Section on Neurology and Medical Jurisprudence of the American Medical Association in June, 1898, as above indicated. Just before sending the paper to the last named meeting I received a copy of a work by J. M. Gerest, entitled "Les Affections Nerveuses Systématiques et la Théorie des Neurones," 1898. The author of this work takes in many respects the same points of view as the writer.

[1] Mill, C.K., and Spiller, W.G.: See Jour. of Nerv. and Ment. Dis., vol. xxv, No. 6, June, 1898. The paper giving the results of this investigation was read at the meeting of the Am. Neurolog. Assoc., held in New York, May 26, 27, 28, 1898.

ject; indeed, this is not the purpose of the present contribution, which is rather to present broad suggestions regarding neuronic classification. Using terms as we now commonly employ them, tabes, like other diseases to which attention will presently be directed, is neither purely spinal nor purely neural, neither purely central nor purely peripheral; but it is an affection primarily of sensory neurons or nerve cells, and Langdon[2], with others, has very properly suggested to regard it as a "sensory neuron degeneration." "As a result of predisposition, hereditary or acquired, and the action of a toxin or toxins (left by a preceding syphilis, usually though not invariably), the nutrition of the nervous system as a whole is lowered. In certain groups of sensory neurons (muscle sense, iris reflex, optic nerve), the impairment is greater or the resistance of the tissue is less, and in these groups degenerative changes occur."

Tic douloureux and some of the forms of primary degeneration which single out the olfactory, optic, cochlear, vestibular and glossopharyngeal nerves should, in the opinion of the writer, be classified with tabes as sensory neuron degenerations.

Let us now, in the development of the same line of thought, turn our attention to some of the well known forms of "sclerosis" and "degeneration."

Most authors still content themselves with describing the pathology of ataxic paraplegia as sclerosis attacking the lateral columns and part of the posterior columns, the posterior root zones usually escaping disease. The lesions in the so-called spinal form of hereditary ataxia differ from those of acquired ataxic paraplegia in that the lesions are more extensive and involve the posterior root zone in all regions of the cord, and the whole of the posterior columns except the small region to the inner side of the neck of the posterior cornu, the direct cerebellar tract being also involved. It would be better to class these diseases as instances of mixed neuron system degeneration. We have in them degeneration beginning both in the sensory neuron systems and in the motor neuron systems, and in the case of hereditary ataxia involving additional special systems.

In amyotrophic lateral sclerosis the parts early invaded are the terminals and collaterals of the cortical motor neuron, and later the ganglion cells of the ventral horns. Both the direct and crossed pyramidal tracts and some of the systems of short fibers in the lateral columns, as well as the cells of the ventral horns, have been found degenerated in careful postmortem examinations. Somewhat frequently in this disease the nuclei of the cranial nerves and the pyramidal tracts in the oblongata and pons are implicated in the degeneration, and in rarer cases this has been traced upward to the peduncles, and even to the motor cortex. In extremely rare cases even the cells of the motor cortex have been found to take part in the disease. It is not improbable that implication of the entire extent of the cortical motor neuron will be more frequently found when the present methods, advanced as they are, are improved and investigations are more complete. The disease is in reality one attacking two systems of neurons, and at least one of the names used as descriptive of it should indicate this fact.

Those forms of progressive muscular atrophy, either acquired or embryonal which presumably have their origin in the nerve cell, should be classified under the head of motor neuronal degeneration, and then subclassified according to their position and extent. Bulbar paralysis should also be classified under motor neuronal degenerations, and subclassified according to the special cranial nerve system involved. More or less generalized cranial motor neuronal degenerations would include the different types of bulbar paralysis; and motor neuronal degenerations of special nerves would give such well known affections as lingual atrophy, facial atrophy (here including painless tic), and the atrophic ophthalmoplegias.

The so-called "primary lateral sclerosis" is something of a stumbling block in our efforts at neuronic classification. According to views long accepted, in this affection the lesion is a degeneration or a sclerosis of both lateral columns, usually beginning in the white matter of the lumbar cord and subsequently passing up the cord, but without involving the cells of the ventral horns. In other words, according to this view we have a primary degeneration attacking and confining itself to the processes of the nerve cells. While this disease has, however, long held its place in the nosology of nervous diseases, only an exceedingly limited number of autopsies *apparently* uphold the pathology above indicated. The probabilities are altogether against the idea of a true primary lateral sclerosis; and the cases which present the well-known symptomatology of this affection can probably all be otherwise relegated, as to Erb's spinal paralysis, amyotrophic lateral sclerosis and hysterical spasmodic paraplegia.

The application of the theory of the neuron to classification is most readily made in the case of the degenerative diseases, and yet the same truths are applicable to diseases which more rapidly run their course, as overwhelming toxemias or active inflammations. In Landry's paralysis the peripheral motor neuron is attacked and largely destroyed. In poliomyelitis, both of the infantile and of the adult type, in the polio-encephalitis superior and inferior of Wernicke, and in the cortical polio-encephalitis of Strümpell, motor neuron systems are attacked. Much controversy has taken place as to whether in multiple neuritis the affection is primarily one of the peripheral nerves (that is, of the axis cylinder processes), of the cell bodies, or of both. Much evidence, clinical and pathological, is certainly in favor of the view that polyneuritis in many cases is a true peripheral disease; but in many other cases those forms of inflammation which are usually designated as neuritis and as poliomyelitis involve the entire neuron, and not simply the peripheral nerve (in the ordinary acceptation of the use of the word "peripheral"), on the one hand, or the cell bodies in the ventral horns on the other. Those forms of so-called polio-encephalitis and polyneuritis which have been most studied are now almost universally conceded to be either of infectious or toxic origin. With regard to multiple neuritis it is no new thing for me to teach the involvement of both nerve and cord in a large number, if not in a majority, of the cases. Long before the theory of the neuron was thought of, I expressed my belief that in many cases of so-called multiple neuritis both periphery and spinal centers were implicated, in other words, as then expressed, we had a concurrence of multiple neuritis and of generalized poliomyelitis in the same case. Several recent investigators have shown involvement of the posterior roots and even of the entire sensory and motor neurons both in multiple neuritis and in cerebrospinal meningitis. Long ago I als

[2] Langdon, F. W.: Med. Record, N. Y., Jan. 8, 1898.

recorded clinical observations on cases of multiple neuritis which eventually became cases of true tabes. Cases of poliomyelitis with implication of the peripheral motor nerves are also on record.

These diseases are, therefore, in some cases at least, neither instances of neuritis in a strict sense or of poliomyelitis. They are perhaps what might be termed "neuronitis," and this term has been suggested, but seems to have an unnatural sound even to a neurological ear.

While the facts which point to the importance of reclassifying certain diseases on the basis of the neuron are clear and convincing, it is difficult to determine on a simple and practical method of doing this. It will probably be best for clinical reasons to arrange these diseases in the first place under the heads of *embryonal* and of *acquired neuronal diseases*, and then to subclassify these according to the particular system or systems of neurons attacked. This subdivision would include (1), diseases of the sensory neuron systems; (2), diseases of the motor neuron systems; (3), diseases of both sensory and motor neuron systems at the same time; (4), diseases of intercalary or associating systems of neurons; and (5), diseases in which numerons systems of neurons are more or less indiscriminately attacked. The fourth and fifth categories will receive only passing attention in this paper. Within these groups an effort could of course be made to subclassify toxemias, inflammations and degenerations, but this will not be attempted in the present paper, and perhaps it would not answer any useful purpose to make the attempt. By far the larger number of neuronal affections are perhaps to be classed under the general head of primary degenerations, at least with our present pathological knowledge; but toxemias and inflammations which do not lead to degeneration are also, as I have already indicated, to be included.

Every thinking neurologist has felt the importance of having some good method of classifying under some general head the numerous hereditary or family affections. The theory of the neuron offers us one of the best methods of doing this. The embryonal or family diseases can be classified with some approach to success under the different physiologic systems of neurons. Under primary embryonal degenerations of motor neuron systems, for instance, such affections as Little's disease, and perhaps other forms of infantile diplegia or hemiplegia, and some of the forms of juvenile muscular atrophy might be grouped; under embryonal degenerations of sensory or of mixed sensory and motor neuron systems might be included Friedreich's ataxia, hereditary cerebellar ataxia, and the common type of syringomyelia; and under special forms of embryonal neuronal degenerations could be classed amaurotic family idiocy, so-called Huntingdon's chorea, for which Halleck has suggested the name of *dementia choreica*, and even perhaps some of the special types of the insanity of developmental periods.

Amaurotic family idiocy is a type of affections in which numerous systems of neurons are arrested in their development, while general paralysis of the insane is a type of acquired disease in which numerous systems of neurons are more or less indiscriminately attacked. Hirt, by classifying this disease under the head of general diseases of the nervous system, recognized the importance of taking it from the category of cerebral affections or of ordinary insanities.

Provisionally the views expressed in the previous pages might be in part summarized in tabular form as follows:

EMBRYONAL NEURONAL DEGENERATIONS.

I. Sensory or sensorimotor types. 1, Friedreich's ataxia; 2, hereditary cerebellar ataxia; 3, syringomyelia.

II. Motor types. 1, spastic diplegia (some types, as Little's disease); 2, progressive muscular atrophy (some types).

III. Mixed and multiple types. 1, amaurotic family idiocy; 2, dementia choreica (Huntingdon's chorea); 3, developmental insanity (some types).

ACQUIRED NEURONAL DEGENERATIONS.

I. Sensory types. 1, tabes; 2, tic douloureux; 3, primary degeneration limited to nerves of the special senses.

II. Motor types. 1, progressive muscular atrophy (some types); 2, amyotrophic lateral sclerosis; 3, progressive bulbar paralysis; 4, primary degeneration of particular motor nerves, as of the hypoglossal, facial, trigeminal and ocular.

For the present it will perhaps be best to place neuronal inflammations and toxemias in a special class, including, 1, acute ascending paralysis (Landry's paralysis); 2, anterior poliomyelitis; 3, polio-encephalitis superior and inferior of Wernicke; 4, cortical polio-encephalitis of Strümpell; 5, multiple neuritis and neuromyelitis.

HOW DOES THE CAUSE OF DISEASE PRODUCE DISEASE? A NEW INTERPRETATION OF OPERATIVE PRINCIPLES.

BY W. R. DUNHAM, M.D.

KEENE, N. H.

The following direction of research was suggested by J. M. DaCosta, M.D., LL.D., in his address before the Association of American Physicians, at Washington, D. C., May 4, 1897: "The great advance of our time it seems trite to say, is the ardent study of the causation of disease. And often what we consider the cause, may thus be only the consequences of disease. The soil and the forces, too, are to be studied and critically examined."

There has been much written respecting the soil of disease, while it is a new suggestion that we critically study the nature of the forces which present disease phenomena. And with such review it may be well to mention, that the science-mind for many generations has been satisfied with the interpretation, that forces from without, that active medical principles and active causes of disease in addition to active vital forces, have taken part in the operations presented by the living human organism, while of recent date the more advanced thinkers deny that supplementary forces can be introduced to operate the machinery of life. Such expectancy, however, has prevailed for a long period and will doubtless be slow of elimination until a clear comprehension is developed respecting the nature of the vital forces.

A distinguished editor of an American medical journal states, as late as January, 1898: "There is no drug yet discovered, unless it be alcohol, which adds to the forces of the body." But even this one source will be discredited when it is recognized that medico-biologic science is based entirely on the functions and operative principles of the vital force energies. Thus in the near future a different operative plan of medical science will be taught in the schools, effecting as great a revolution of ideal *modus operandi* as was experienced in the acceptance of the Copernican interpretation of astronomic plan. Therefore, in place of teaching medico-biologic science as being based on functions and operative principles, derived from both within and without, this division of natural science will have its recognized first principles begin-

ning with a comprehension of the nature of the vital force agency. But in making research for the discovery of such primary principles we shall be required to differentiate between the functions of the several ultimate active divisions, which enigma has never had a pretense of solution from the many teachers of medico-biologic science. And furthermore, we shall be confronted with high authority alleging that the mind can not grasp the nature and ultimate functions of the vital force agency. That distinguished authority, Henry Maudsley, M.D., F. R. C. P., states: "It is easy to perceive how impossible it is in the present state of science to come to any positive conclusion in regard to the nature of vital force. This, generation and generations to come, will have passed to their everlasting rest before a discovery of the secret of vital activity is made." Notwithstanding such statement, the vital force problem as implied in the operative plan of its several ultimate principles is already solved, and is no more difficult to comprehend than the Copernican plan of astronomic science and may be as positively demonstrated. The fact is, the cultured mind is so well satisfied with the long accepted interpretation that active principles from without may be introduced to operate the human organism, that little or no desire is experienced for the making of research, for exercising original thought, to discover the operative plan of the vital force function. And it is only of recent date that a review of the alleged situation has been suggested.

It has always been difficult to eliminate ideal errors of long acceptance, which is most significantly illustrated in the incident, that such entire satisfaction prevailed with the Ptolemaic interpretation of astronomic plan, that it required more than one hundred years to develop a comprehension that any scientific advantage would result from a review of the alleged situation. And it is a fact that can be demonstrated, that the medical science mind has committed a far more serious error of interpretation of operative plan than was perpetrated by the ancient astronomic investigator, which lamentable misfortune is not generally known.

Says Dr. Lionel S. Beal, M. B., F. R. C. P. Lond., F. R. S., in the London *Lancet*, May 24, 1896: "I am particularly desirous of directing attention to the question of vitality just now because during the past year there have been indications of a change of opinion, and the prospect of obtaining a patient hearing is better than it has been for thirty or forty years. Vitality is a distinct force and every pathologic change is directly consequent upon vital action." Rudolph von Virchow, M. D., in his address before the International Medical Congress in Moscow, 1897, stated: "I freely confess that the seeking of the point at which medicine begins to form a part of biology has been one of my fads; hence I have devoted the last days of my life to establish and spread the idea that pathology should be considered a branch of biology. This is natural, but the delicate point is, in order to realize it in a precise manner, how to establish the relations uniting life with disease." A patient research in this direction will certainly reveal to the comprehension that active vital functions constitute all the "active principles" that may operate the living human organism in health and disease. Consequently, the doctrine as now taught, that some mysterious active principle is introduced from without in association with the cause of disease, that acts to produce disease, in other words, that forces from without, forces not vital, attack the human organism, is an error of great and serious magnitude. Therefore, to understand how the cause of disease produces disease, it will be necessary to first comprehend the special functions of each ultimate operative vital principle, and the co-operative working plan for the presentation of the two grand divisions of life activities, voluntary and involuntary, both health and disease being manifested by the department of involuntary activity.

To comprehend how the involuntary organism is set into that special disturbance constituting disease, we must examine the working plan of ultimate vital functions, normal and abnormal. And in seeking the solution of the vital force problem implied in the *modus operandi*, we will consider first the special function of each ultimate life principle, as expressed in the terms, sensibility, instinct, sensation and contractility; and later, the co-operation of said functions.

Sensibility, the mind function, relates the individual to the external world and superintends the voluntary acts, using the life principle contractility to execute voluntary motion. Among the numerous subdivisions of this department there may be included the ability to think, reason, originate ideas and experience a variety of emotions.

Instinct is that life function which superintends all involuntary acts comprised in organic construction and structural repairs; using food material and eliminating waste and foreign material. Instinct is a life function but not a mind function, a distinction to be ever recognized, while sensibility is both a life and mind function.

Sensibility can not execute the functions of instinct, nor reversely.

Sensation is an operative life principle entirely different from the two departments mentioned. It is a life function but not a mind function, and is the life principle which relates the organism to the contact world, while sensibility relates the individual to the external world. Sensation is a life principle of great magnitude and importance to consider, in fact a department that would require much time to describe, entering into a vast multitude of obscure life problems. Among the numerous subdivisions of expressed special functions included in this division may be mentioned taste, smell, heat, cold, itching, pain and all degrees of irritability, which last term includes a great variety of disagreeable sensations. Sensation is a life function expressed from relations of contact, and is manifested by the entire human organism, while sensibility is manifested only through the brain.

Contractility is the life principle that manifests animal strength and executes motion, and is the vital principle exercised by the mind for presenting voluntary motion, and by the instinct in the presentation of involuntary activities.

The foregoing terms, which represent the distinct departments of ultimate operative life principles, are not of new coinage, but have ever been attended with the great misfortune that no practical distinction has been recognized and taught respecting the special function of each department, and their co-operation as expressed in the complex affairs presented by the living human organism, while it is not possible to understand the nature of vital force until we first distinguish the difference between such operative functions and determine what each department executes as a life act. Thus a knowledge of such functions consti-

tutes the starting point of thought in medico-biologic science. In other words, we can not explore thought regions existing as transpiring events prior to the manifestation of such special principles of life expression. And we must recognize, also, that the nature of vital force is implied in what those functions execute, normal and abnormal.

While distinguished authorities allege that the vital force problem is impenetrable, such is not the fact, and this belief is perpetuated because the mind has failed to discover that any practical knowledge may be acquired from a recognized distinction of function, as executed by the four mentioned departments of operative life principles, a department easy to comprehend and demonstrate. Consequently, from this omission of distinction the terms sensation and sensibility are used synonymously without any apparent clear idea of their precise application. Some textbooks allege that the skin is the organ of sensibility and the brain of sensation, while the late Thomas H. Huxley has committed a similar error in attributing to the skin the function of sensibility and consciousness. The function of instinct is also confounded with that of sensibility, and nearly all writers give credit to that life ability called instinct, for the exercise of both voluntary and involuntary activities; and no practical distinction appears to be recognized between instinct and innate intelligence.

After the thoughtful mind has made original research and become satisfied that the four mentioned divisions of alleged operative principles really exist, and mean something in each, executing a function peculiar to itself, it will next be important to consider the working plan of co-operation, in other words, the *modus operandi* for the presenting of the two grand divisions of life activities, the voluntary and involuntary. The following is suggested as the real plan, and is easy of demonstration: That voluntary acts are exercised in response to the mind, while involuntary acts are exercised in response to sensations. In illustration, sneezing is an involuntary act executed in response to a sensation.

The alleged reflex act executed in response to stimuli, or irritation, which language is slightly misleading, represents a similar operation to that implied in the phrase: "Involuntary vital acts are exercised in response to a sensation." A sensation is a primary expression of life principle. There has been no previous action for its development, but merely a passive contact. Thus the term "reflex action" is not the correct language for the best explanation of the event. The irritability of a nerve is not an action on the nerve, but an expression of contact relation by the nerve, as a previous condition that may determine whether a physiologic or pathologic vital act is to succeed.

The conditions called health and disease are each presented or executed as involuntary acts in response to existing sensations, normal or abnormal. There are problems in medico-biologic science that require a clear mental perception, not the microscope, to effect a correct solution.

In accordance with the operative plan of the vital force agency, it is to be recognized that the mind directly superintends voluntary activities and indirectly superintends, to a limited degree, involuntary life acts, by developing such special sensations from contact relations as will be succeeded by the kind of involuntary act that it is desired to have established, or set into special operation. Consequently, medicine is useful, not because of an associate active principle, but as the means from a relation of contact for the developing of special sensations. The idea that medicine acts is misleading; there is no medical power, but medicine causes special sensations in response to which involuntary life acts are exercised.

When we comprehend that physiologic acts called health, succeed to normal sensations, and pathologic acts called disease, succeed to abnormal sensations, it then becomes easy of solution as to how the cause of disease produces disease. The contact of the cause of disease produces abnormal sensations in response to which pathologic vital action is exercised, and this pathologic act in itself constitutes active disease. There is no "active principle" except pathologic vital action associated with disease problems. While this interpretation of operative plan may be easy of demonstration, there is something more than intellectual pride to be considered in association with this view of the situation. The present doctrine that "active principles" from without may be introduced to operate the machinery of life, opens the door for the ignorant to practice medicine, even to the satisfaction of the large majority who have been thus educated. Therefore, it is regarded as of minor importance from whose hands the supplementary powers may be supplied. While with a correct theory and general understanding by the lay mind, of the operative plan of medico-biologic science, as is now understood of the general plan of astronomic science, then no intelligent invalid would emyloy a physician who did not comprehend the working plan of the vital force energies.

In returning to the consideration of scientific principles it becomes evident that the condition expressed as an abnormal sensation constitutes the intervening situation always existing between the cause of disease and the development of disease as the first change experienced from the departure of health.

That ultimate life function expressed in the name of sensation is a department having many complex relations with the human organism, vastly more than can be considered at this time. Some sensations are recognized by the mind while many are not, that have direct relations with the involuntary department superintended by instinct. Keeping in mind that the involuntary department is set into special activity in response to a sensation, and not from an active principle introduced from without, it may be understood that the cause of disease does not attack the organism, and that all causes including microbes and germs are passive and merely cause abnormal sensations, that condition necessary for the presentation of involuntary pathologic activities; thus there is no warring of forces from without with the forces within.

When considering the relation of causes we should also recognize that while many causes are introduced from without, there is a larger number developed within. And we should observe a distinction between primary and secondary causes. The former may occasion a disturbance which, in itself, later develops a great variety of secondary causes for the continuance of disease. Such causes may exist as pathologic fluids which may undergo chemic changes having most virulent relations, together with congestions producing abnormal sensations of various kinds and degrees, with an increased temperature of the blood, often a dangerous cause, each being a secondary

cause for the perpetuation of pathologic activities.

The foregoing statements, when considered in association with the plan now taught, respecting operative medico-biologic science, may seem void of practical utility, but after the mind has grasped the correct interpretation implied in the separate functions of the four departments of ultimate active principles, it may then be recognized that this view of the situation is of exceeding great value in the management of disease. With medico-biologic science as well as with astronomic, it is important that we start right, that we recognize the correct operative plan, which will enable us to better understand the many details that are extremely practical to consider in persuading what we should do with the numerous variety of causes of disease, in other words, enabling us to better protect the patient from the relation of such causes. Some causes require to be neutralized by chemic changes which include the antiseptic, while other causes should be eliminated as early as possible. In many instances we should change the existing sensation, often completely swap sensations with medicinal contacts, and even abrogate sensations temporarily with opiates. And there can always be very much done to prevent the development of secondary causes within. It is often important to diminish the rapidity of production of the specific causes that develop as secondary causes with non-recurrent contagious disease, thus allowing elimination to keep up with the supply, and great success may attend the deploying of vital activity.

In the treatment of disease each of the several methods require consideration as to their applicability separately and jointly, a kind of thought exercise vastly superior to the treating of disease from a basis of experimental statistics. And there are two grand divisions of disease, one existing simply as abnormal sensation, and the other an associate disturbance existing as pathologic vital action. Both divisions may prevail separate from pathologic cellular construction, which constitutes malignant disease.

In summing up, we must keep in view the distinct functions of the four divisions of ultimate operative principles, how the cause of disease produces disease, the two divisions of causes existing as primary and secondary and protection of the organism by resort to different methods of treating causes existing in association with the two grand divisions of disease. Thus that higher education which is to contribute to a more successful treatment, and also protect invalidism from medical sharks, must be acquired through a better knowledge of the nature of vital forces expressed in special co-operative principles, that department of possible erudition which distinguished leaders allege must await the advent of future gen rations for its solution.

The authority quoted at the commencement of this paper suggested that we examine "the soil and that often what we consider the cause may be only the consequence of disease." Thus, respecting the soil, it is evident that micro-organisms will multiply rapidly wherever there is a food supply, and expire equally as rapidly when the supply is arrested. And the special food or soil favorable for this development in the human system is made to exist largely from pathologic vital action. Thus in the virus produced by non-recurrent contagious disease, the micro-organisms will multiply into millions and perish when the food supply or *materies morbi* is no longer elaborated. In such instance the presence of the microbe becomes a consequence rather than a cause of the disease. And the reason why certain contagious disease is non-recurrent, is that the human organism can seldom develop such special virus but once in a lifetime, the *materies morbi* of such disease being a product from pathologic vital action and not a poison excreted or secreted by the microbe. The microbe does not come in and attack the human organism, but they simply multiply and consume the virus as scavengers. And in close association with such facts we are required to consider that complex problem represented in the term immunity. This problem, as well as the reason why certain contagious disease is non-recurrent, can not be explained from the present plan taught of operative medico-biologic science, while it is very easy of solution when considered from the correct plan of operative vital energies relative to existing causes of disease.

Scientifically considered, the immuning principle is not operative except with non-recurrent contagious disease, while the temporary protection afforded with other forms of disease is not from immunity, but a protection from the deployment of pathologic vital activity. Whereas that protection experienced in the name of immunity, made possible with non-recurrent contagious disease is explainable as follows: With such form of disease a special morbid change prevails but once in a lifetime as the general fact, which pathologic act elaborates the virus of dangerous relations. And the danger attending such disease exists because such virus is produced more rapidly than it can be disposed of by elimination, thus becoming a secondary cause for complex disturbance. But when attenuated virus is introduced, a mild and incomplete pathologic disturbance will prevail, developing the special virus within the limit of safely possible elimination. And later, when pure virus becomes introduced, the previous partial change already effected has made it impossible for the organism to produce such virus rapidly in excess of elimination, as would be the fact had no previous mild disturbance been developed. Thus safety is practically insured because such pathologic disturbance has been effected on the installment plan. And with such disease the microbe or alleged germ develops rapidly from the abundant supply of food, but doing no harm to that organism which is the land of its birth, although such micro-organisms may become carriers of the poison, bottling up the special virus by their organization and giving it a longer existence. Such virus constitutes a secondary cause of disease in the organism where it is elaborated, and a primary cause when introduced within an organism that has never experienced such form of pathologic disturbance, while harmless to an organism that has previously experienced such disturbance. It is the virus, not the microbe, that becomes the cause of disease. The microbe or alleged germ may be a carrier of virus, while the virus of microbe construction is the real cause of disturbance. M. Pasteur states that the "virulency of the microbe depends on the quality of the material from which it is constructed." The microbe is not sufficiently complex in its organization to perform the function of excretion or secretion of poison, but does multiply and perish rapidly, to be succeeded by new births from the same material; and in the meantime the special pathologic virus may undergo chemic changes and become a more dangerous poison. Thus when we keep in mind the *modus*

operandi of how the cause of disease produces disease, we shall experience less fear of the microbe family and have less to say of disease germs. It is only the micro-organism that have been developed from some virus cause of disease that occasion pathologic disturbance to be manifested.

The cause of disease does not attack the living human organism. It does not act. The machinery of disturbance is operated wholly by the vital force. The cause is passive and only occasions abnormal sensations by its contact, generally expressed as irritibility, in response to which pathologic vital action is developed, which in itself constitutes active disease. The superior success in modern surgery, alleged to be due to the killing of micro-organisms, may be better explained through the fact that the microbe-killer has changed the elaborated synthetic organic fluids, harmless as such, but which may soon enter into chemic changes in their downward career, producing poisonous products of dangerous relations existing as causes of disease developed within. Yet while the result of such practice has been construed in support of the germ theory of cause, the other explanation of protection is equally as well supported and certainly in better accord with the correct plan of operative life functions.

There is no army of disease microbes hovering in the air awaiting opportunity to attack exposed tissues, and the phrase "disease germ" is a misnomer failing to represent the correct situation of complex associations. The term is destined to become eliminated, being without usefulness in explanation of medico-biologic problems. Some forty years ago distinguished surgeons discovered that in operations, were the flaps allowed to remain exposed to the air until the oozing had ceased and the surface became glazed over, great advantage was insured to the individual.

And there is another discovery to be made of significant importance, implied in the fact that there is a vast amount of alleged medical science education inculcated that fails to develop scientific intelligence adding confusion in place of illumination to the vision of mental perception.

In closing I will call attention to another special feature of the situation, to be critically considered within the department of medico-biologic science, in the fact that ancient men made a serious mistake of interpretation respecting the operative plan, equally as fallacious scientifically as that perpetrated and long accepted by the early astronomer, as the Ptolemaic version. And this great error of dangerous infliction has been perpetuated unto our generation, and is now being thrust upon a defenceless people who are without thoughtful ability of escape, being assured through the influence of revered names that have become historic for presumed intellectual achievements, while such fame will be recorded in future history inglorious of scientific merit, and on a level with that of the early astronomers who failed to think in accordance with nature's methods regarding the operative universe. And among the numerous inflictions that have been thrust upon a civilized people from such error, may be recognized the misery which comes from a belief in the doctrine that alcoholic spirit may supply an "active principle" from without, as a supplementary power that will assist vital strength as remedial of weariness and debility. And no doubt there are many learned men who are so well satisfied with the present pseudo-scientific education, and so persistent that new facts must be weighed by old methods, so over-persuaded by their early convictions, as to not care to give time for the comparison of this modern interpretation with the life phenomena presented. Yet it will ever remain a fact, not possible of supported contradiction, that medico-biologic science is based on the ultimate vital functions, normal and abnormal, of the four mentioned divisions of operative life principles.

THE ALLOXUR BODIES AND THEIR ESTIMATION.

BY H. RICHARDSON, M.D.,
CLINICAL PATHOLOGIST, MOUNT HOPE RETREAT, MD.

The alloxur bases have recently excited considerable interest among pathologists, partly on account of the difficulties of their direct estimation, but principally from the failure of exact analysis to confirm the "uric acid diathesis" theory.

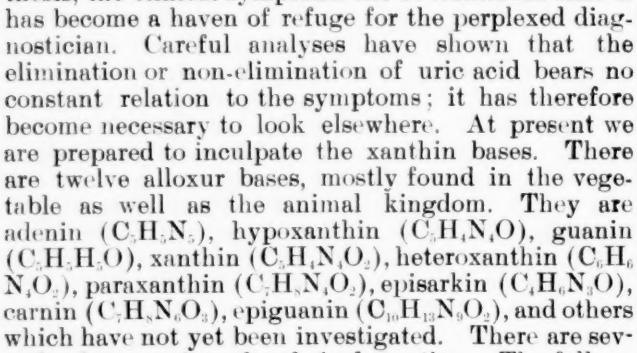
The latter theory dates from Garrod's discovery of an excess of uric acid in the blood in true gout, to culminate in Haig's teachings, who sees no difference between true gout, articular rheumatism, epilepsy, the "rut" of the springtime, religious excess and masturbation. He bases his theories on the formation of uric acid in the kidney, in a proportion of 1 to 33 of urea, when, owing to not very clearly defined conditions, a portion of the uric acid fails to be eliminated and is carried into the general circulation, to be deposited in the system, causing all sorts of ills when it is brought again into the circulation. Horbacewski has proved that uric acid and the alloxur bases are formed from nuclein, and therefore we should expect, and we find, an increase of uric acid in leucocystosis, or any wasting disease, where there is excessive cell destruction. Haig's method of estimation of uric acid, viz., Haycraft's, is admittedly inaccurate, and further he administered salicylic acid or the salicylates to eliminate the uric acid. Boden has pointed out that the salicylates produce a leucocytosis, and in some very careful experiments shows that the elimination of uric acid runs parallel with the number of leucocytes.

Roberts, in his very elaborate investigations, finds that the uric acid exists in solution in the blood as a quadriurate ($C_5H_2N_4O_3HMC_5H_2N_4O_3H_2$), and that in the presence of an alkali the biurate is formed ($M_2C_5H_2N_4O_3$), which is barely soluble. This explanation accounts for the comparative failure of the alkaline treatment in gout and the insolubility of the tophi. He accounts for the precipitation of the uric acid in the joints, by the analysis of the synovial fluids, which he claims are the most alkaline secretions in the system. If the biurate comes in contact with a weak free acid or an acid salt, it is converted into the quadriurate and dissolved in the blood. Acid sodium phosphate (NaH_2PO_4) is the one used by nature and clinical experience partly goes to show that it acts as an eliminate of uric acid, besides in some cases reducing the tophi.

There are three ways to account for the excess of uric acid in the system: Imperfect excretion, increased formation, and both combined. In the early stages of gout, pathologists have failed to find any kidney lesion, and as other substances are eliminated in normal quantity, if kidney insufficiency was the cause, it would point to a special cell in the tubules, whose duty it is to eliminate uric acid, which presupposes an exactness of method not usual in the economies of

nature. It follows, therefore, that we must look to an increased production, and as in gout there is no leucocytosis and no pus, an excess of cell destruction, usually described as of nervous origin, is the conclusion by exclusion; added to this gout is usually associated with digestive disturbances pointing to defect in nutrition as the primary cause.

In the so-called gouty diathesis or uric acid diathesis, the clinical symptoms are so numerous that it has become a haven of refuge for the perplexed diagnostician. Careful analyses have shown that the elimination or non-elimination of uric acid bears no constant relation to the symptoms; it has therefore become necessary to look elsewhere. At present we are prepared to inculpate the xanthin bases. There are twelve alloxur bases, mostly found in the vegetable as well as the animal kingdom. They are adenin ($C_5H_5N_5$), hypoxanthin ($C_5H_4N_4O$), guanin ($C_5H_5N_5O$), xanthin ($C_5H_4N_4O_2$), heteroxanthin ($C_6H_6N_4O_2$), paraxanthin ($C_7H_8N_4O_2$), episarkin ($C_4H_6N_4O$), carnin ($C_7H_8N_6O_3$), epiguanin ($C_{10}H_{13}N_9O_2$), and others which have not yet been investigated. There are several schemes given for their formation. The following is Neuman's:



Thymin and cytofin are two recently discovered bases, of which the reactions have not yet been published.

The total amount of alloxur bases eliminated in twenty-four hours in the urine is very small, varying very considerably with diet. Camera found that with mixed diet the elimination was 87.0 mg., with flesh diet, 44.0 mg., with cabbage and apples 111.0 mg., with vegetable diet (peas and cabbage) 72.0 mg. He finds that the proportion of nitrogen in the xanthin bases to that of the uric acid is as one to 18.1, 7.6, 35.8, 18.1 respectively. Salkowski finds the proportion of uric acid to xanthin bases to be about 13 to 1; Flatow and Reitzenstein make the average quantity eliminated 29.2 mg.

Adenin ($C_5H_5N_5$), was discovered by Kossel in 1885 and is the simplest member of the group; it is apparently a polymerization of hydrocyanic acid. It is oxidized into hypoxanthin by the substitution of oxygen for an amido group. Lillienfield, in his study of the chemistry of leucocytes, has shown that the nucleus of the cell contains a complex nucleohiston which is decomposed by acids into histon and leuconuclein; the latter can in turn be decomposed into albumin and nucleinic acid, which, on heating with mineral acids, yields phosphoric acid and the nuclein bases. Adenin is best prepared from the mother liquor of tea. It does not appear to have any physiologic action. It has been found in the urine of leukemia. Hypoxanthin, or sarkin ($C_5H_4N_4O$), is the oxidation product of adenin, from which it can be formed with nitrous acid. It is a normal constituent of human urine and has been found in excess in liver and kidney diseases by Thudichum, also in fevers and nervous diseases by Pouchet; according to von Jaksch it is present in exudates and transudates. Its physiologic action has been studied by Filhne, who states that 25 to 100 mg. begin to act on frogs in six to twenty-four hours, causing increased reflex excitability with convulsive attacks.

Guanin ($C_5H_5N_5O$) is principally made from guano. Von Jaksch states he has found it in transudates and exudates. Most observers have failed to find it in normal urine. Pouchet has found it in fever and nervous diseases.

Xanthin ($C_5H_4N_4O_2$) occurs rarely as calculi, more often as crystals in the urinary sediment. Normal urine is said to contain 0.032 to 0.025 grams in twenty-four hours. In the urine of leukemia, Stadthagen found an average of 0.07 gm. In tabes dorsalis, Pouchet found 0.08. The physiologic action is said to be a muscular rigor and paralysis of the spinal cord; the heart muscle is also affected.

Paraxanthin ($C_7H_8N_4O_2$), or dimethylxanthin, occurs in very small quantities in normal urine, it being only capable of detection in five to six liters. Rachford has found that it exists in excess in cases of migraine, and in epilepsy which is accompanied or preceded by migraine. He has not been able to find it in other forms of epilepsy. It is probably the most toxic of all the xanthin bodies yet studied, 1 to 2 mg. producing almost at once a rigor mortis-like condition of the muscles injected, with diminished reflex excitability without previous increase. Six to eight milligrams introduced into the lymph-sac bring on gradual loss of voluntary motion as well as of reflex excitability. In mice the reflexes are increased almost to a tetanus. The injection of 0.2 gm. in a 500 gr. guinea-pig produced convulsions and death in half an hour. The action of xanthin, hypoxanthin and paraxanthin seems similar, differing in degree.

Carnin ($C_7H_8N_6O_3$) appears to have no physiologic action.

Gerontin ($C_5H_{14}N_2$) has not been investigated, but is said to effect the nerve centers and heart ganglia; 0.5 mg. will kill 10 grams of frog.

Spermin ($C_5H_{14}N_2$) (?) is said to be tonic in its action.

From our knowledge of these bases it seems as if they are hardly likely to be of any great importance in diagnosis. Paraxanthin and possibly xanthin are the only members of the group which up to the present have been definitely associated with a disease.

There are three methods by which the xanthin bases can be estimated as a whole, viz.: The methods of Camera, Krüger-Wolf and Salkowski. The first two are open to the objection that they do not estimate the xanthin bases directly, but by estimating the nitrogen of the alloxur bodies and deducting the nitrogen of the uric acid estimated by some other method, thus throwing the whole of the error on to the xanthin bases.

Camera's method is as follows: Take a given quantity of urine and add a solution of sodium hydrate containing about 1.0 and dilute the urine to 1010 or 1011 specific gravity. Take aliquot part of diluted urine, add 5 c.c. Salkowski's magnesia mixture, filter; take aliquot part of filtrate, add 0.5 calcium carbonate and 5

c.c. of 3 per cent. solution of silver nitrate, allow to stand about two hours, filter; wash free from chlorin and silver, dry over sulphuric acid and estimate the nitrogen by Kjeldahl method.

Camera's modified method is somewhat more simple: Take 240 c.c. of urine, add 30 c.c. Ludwig's magnesia mixture and 30 c.c. 20 per cent. ammonia; shake well and filter; take 125 c.c. of filtrate (equal to 100 c.c. urine), add 10 c.c. of 3 per cent. ammonia silver nitrate solution, filter, wash and estimate nitrogen by Kjeldahl method.

Salkowski's magnesia mixture is made with magnesium sulphate 1 part; ammonium chlorid 1 part; ammonium hydrate, sp gr. 0.924, 4 parts; water 8 parts.

Ludwig's magnesia mixture is made with magnesium chlorid, 100.0 grams, dissolved in water; add ammonia in excess and then ammonium hydrate until the precipitate is dissolved and fill up to 1000 c.c. with water.

The Krüger-Wolf method: Take 100 c.c. urine, boil, filter and add 10 c.c. of a 50 per cent. solution of sodium bisulphite, then 10 c.c. of a 13 per cent. solution of copper sulphate; after short boiling add 5 c.c. of a 10 per cent. solution of barium chlorid; remove from heat and allow to stand for two hours; filter, wash about five times with boiled water cooled to 6 degrees C., and estimate the nitrogen in the precipitate by the Kjeldahl method.

In all of the above methods the uric acid has to be estimated separately, the nitrogen calculated and deducted from the nitrogen found, the remainder being the nitrogen of the xanthin bases.

The usual method of estimating the uric acid is that of Hopkins of London, England. The writer uses the following modification: Take 100 c.c. of urine, acidulate with acetic acid, neutralize to slight alkalinity with ammonia and saturate with ammonium chlorid (about 30 grams is required); after standing three hours the precipitate is filtered, preferably with a suction-pump, the precipitate well washed with a saturated solution of ammonium chlorid, dried at 100 degrees C. to drive off any ammonia; then dissolve in distilled water, boil, cool, add 50 c.c. of a decinormal solution of hydrochloric acid, raise to the boiling point, cool and titrate the excess of acid with a decinormal soda solution, using dimethyl-amido-azo-benzol as indicator. The difference between the quantity of decinormal hydrochloric and soda solutions multiplied by 0.0168 will give the amount of uric acid, which divided by three will give the amount of nitrogen. As will be shown below, this method is not correct as some of the xanthin bases are partially precipitated by saturation with ammonium chlorid.

Salkowski's method recently published has the advantage over the above methods in that it estimates the xanthin bases directly: Take 600 c.c. of urine and add 200 c.c. of magnesia mixture, allow to stand one hour; filter; take 700 c.c. of the filtrate and add about 18 c.c. of a 3 per cent. solution of silver nitrate and allow to settle; if the precipitate appears granular or does not settle quickly add a little more ammonia, but as the xanthin silver salts are not perfectly insoluble in ammonia this requires care; take a specimen of the supernatant liquor and add nitric acid; if a precipitate takes place then the silver is sufficient. After standing one hour filter in a large filter and wash until on the addition of silver nitrate to the washings only a slight cloud is produced. The precipitate is suspended in water, a few drops hydrochloric acid added and the solution saturated with dihydrogen sulphid, warming gently on the water-bath; filter and wash well; evaporate the filtrate to dryness, first on the flame and then on the water-bath. To the residue add 20 c.c of a 3 per cent. solution of sulphuric acid (H_2SO_4 30 c.c., H_2O 900 c.c.), warm gently and allow to stand twelve to eighteen hours; filter; wash twice with the 3 per cent. sulphuric acid solution and once with water; add excess of ammonia and 1 or 2 c.c. of silver nitrate, testing as above as to quantity required; filter; wash well; dry, ash the filter in a porcelain crucible, dissolve the silver residue in nitric acid and estimate the silver by the Vohlhardt method.

Salkowski prefers estimating the silver instead of the nitrogen, on the ground that some ammonio-silver compounds are formed, which cause high results, on the other hand, adenin at least, and probably others of the xanthin bases form two silver salts which would tend to give high results by his method also. It is probable that by boiling the silver xanthin precipitate with magnesium oxid the ammonio-silver salt would be broken up and the ammonia set free.

The method is cumbersome, the filtration and washing of the large gelatinous precipitate, and the evaporation of a liter to dryness take considerable time. The author has substituted the following process, which gives the same results and is less troublesome:

It was necessary first to find out whether the whole of the uric acid was precipitated by the saturation with ammonium chlorid; to this end a sample of bought uric acid was purified by warming with 3 per cent. sulphuric acid, cooling, filtering and washing with water and then dissolving in a little potassium carbonate. Three portions of 100 c.c. each of the solution were each acidulated with acetic acid, neutralized with ammonia, saturated with ammonium chlorid, allowed to stand three hours, filtered, washed with a saturated solution of ammonium chlorid, the filtrate and washings made strongly alkaline with ammonia, 3 per cent. silver nitrate solution added, filtered, the precipitate washed, dried at 100 degrees C., and the nitrogen estimated by Kjeldahl's method; at the same time, to prevent error from possible nitrogen containing impurities in the reagents used, and from the ammonia in the atmosphere of the laboratory, a control test was carried through at the same time; four other tests were subsequently made under the same conditions with the following results:

	No. 1.	No. 2.	No. 3.	No. 4.
Nitrogen in filtrate found.	0.00014	0.00035	0.00042	0.00014
Nitrogen in control	0.00028	0.00028	0.00028	0.00007
Actual nitrogen in filtrate.	−0.00014	+0.00007	+0.00014	+0.00007

	No. 5.	No. 6.	No. 7.
Nitrogen in filtrate found	0.00007	0.00042	0.00042
Nitrogen in control	0.00007	0.00028	0.00028
Actual nitrogen in filtrate.	0.00000	+0.00014	+0.00014

The average actual nitrogen found in the filtrate, after precipitation by saturation with NH_4Cl, on the seven experiments was therefore 0.00006 or 0.18 mg. uric acid, showing that the whole of the uric acid was precipitated.

Being satisfied with this result, the following process was tested against the Hopkins and Salkowski methods: To 600 c.c. of urine add 200 c.c. of Salkowski's magnesia mixture; allow to stand one hour; filter; acidulate 700 c.c. of the filtrate with acetic acid; neutralize to faint alkalinity with ammonia, and saturate with ammonium chlorid (about 150 grams are required); allow to stand three hours; filter and wash with saturated ammonium chlorid solution. Warm the precipitate in a porcelain dish with 3 per

cent. sulphuric acid and allow to stand twelve to eighteen hours; filter; wash twice with 3 per cent. sulphuric acid and once with water. The filtrate including washings should not exceed 50 c.c. (3 per cent. H_2SO_4 dissolves uric acid in the proportion of 1 to 20,000). The fitrate containing the xanthin bases is added to the first filtrate, the mixture made strongly alkaline with ammonia, 3 per cent. silver nitrate solution added, filtered, washed and either the nitrogen estimated by Kjeldahl's method or the filter incinerated, the silver dissolved in nitric acid and estimated by the Vohlhardt method.

As some of the xanthin bases are precipitated by saturation with ammonium chlorid, in the following estimation the solution of xanthin in 3 per cent. H_2SO_4 solution and the filtrate from the saturation were estimated separately.

Hopkin's method.	No. 1.	No. 2.	No. 3.	No. 4.
Uric acid nitrogen	0.05208%	0.04032%	0.03528%	0.03268%
Xanthin nitrogen in filtrate from ammonium chlorid solution	0.00238%	0.00112%	0.00294%	0.00182%
Salkowski's method.				
Nitrogen of xanthin bases	0.00825%	0.00284%	0.00267%	0.00346%
Author's method.				
Xanthin nitrogen in saturation filtrate	0.0026 %	0.0018 %	0.00226%	0.00173%
Xanthin nitrogen in H_2SO_4 filtrate	0.00108%	0.0016 %	0.0008 %	0.00093%
Total xanthin nitrogen,	0.00368%	0.0034 %	0.00306%	0.00266%

It will be seen from the above four analyses made from urine that the methods employed give practically the same results, the average difference being 0.000536. The first three were mixed urines; No. 4 was a normal urine and it will be noticed that the proportion of xanthin base nitrogen to uric acid nitrogen is higher in No. 4 than in the pathologic mixed urines.

The author claims that his method is more simple and occupies less time than Salkowski's, while giving practically the same results. Owing to laboratory difficulties the estimations of the nitrogen were made by Kjeldahl's method, a control being run through at the same time, and not by estimation of the silver.

Some experiments made some months ago led to the conclusion that xanthin was precipitated by saturation with ammonium chlorid out of an alkalin solution; whether completely was not discovered. Allen of Sheffield, England, states that it is probably almost completely precipitated under the above conditions. An attempt was made to settle the point by the following experiments.

A solution was made from some bought crystal xanthin, containing by calculation, 0.0033 nitrogen per 100 c.c. The solution was acidified with acetic acid, made slightly alkaline with ammonia and saturated with ammonium chlorid, allowed to stand three hours, filtered and washed with saturated solution ammonium chlorid. The precipitate was then warmed with 3 per cent. sulphuric acid and allowed to stand eighteen hours, filtered, washed and the filtrate precipitated with ammonio-silver nitrate sollution, filtered, and the nitrogen estimated.

The filtrate from saturation with ammonium chlorid was also precipitated with the silver solution and the nitrogen estimated in the precipitate. The following results were obtained:

	No. 1.	No. 2.	No. 3.
Nitrogen of xanthin not precipitated by NH_4Cl	0.00168	0.00191	0.00182
Nitrogen of xanthin precipitated by NH_4Cl	0.00126	0.00102	0.00096
	0.00295	0.00293	0.00278

The experiments show that xanthin is only partially precipitated by the method employed.

The author has made a considerable number of estimations of the xanthin bases, but has failed to find any relation between them and mental disease, their total quantity varying in proportion to the metabolism, appearing to be greatest in quantity when the uric acid is small and lowest when it is excessive. He has failed to verify Rachford's results in epilepsy as yet, but a typical case of migraine epilepsy has not presented itself. In two cases of tabes dorsalis the total xanthins were excessive. As stated above it seems doubtful whether the xanthins are of much pathologic importance, their presence in excess being, probably, evidence of a want of oxidation in the metabolism.

ON THE EXISTENCE OF EPIDEMIC CEREBRO-SPINAL MENINGITIS IN CHICAGO, WITH REPORT OF A CASE WITH AUTOPSY.

Read at the Meeting of the Chicago Society of Internal Medicine, June 23, 1898.

BY JAMES B. HERRICK, M.D.,
CHICAGO.

The object of this paper is to prove two facts, first that a genuine case of epidemic cerebro-spinal meningitis has occurred in Chicago, the proof resting on the clinical history and the autopsy, the latter showing the presence of the meninges of the diplococcus intracellularis meningitidis of Weichselbaum; second, that this case was not a sporadic one, but that many other cases have occurred, or in other words, that there is a mild epidemic of cerebro-spinal meningitis in this city. So far as I can learn this is the first case of this disease reported for some time in this city and the first case in which the presence of the meningococcus has been recorded as found, thus establishing the nature of the disease beyond a doubt. That many other cases have been recognized as epidemic cerebro-spinal meningitis, I am well aware from conversation with physicians.

The patient was a male of 40 years, who on Friday, June 10, 1898, had a severe headache and backache. About this time he vomited. Tuesday, June 14, he came under my care in the Presbyterian Hospital. There was severe frontal and occipital headache, causing sleeplessness, and only relieved by morphin. The neck was rigid, and painful on attempted motion; there was but slight retraction of the neck. There was no paralysis nor any sensory disturbance aside from the pain already mentioned. The examination of the chest was negative. Over the skin of the abdomen and the thighs were very many light purple or violet petechial spots, but a few of them being larger than the head of a pin. The spleen was not palpable. The urine showed neither albumin, sugar, nor casts. The mind was clear, but the patient was restless and constantly complaining of his head.

He lived until 10:45 P. M. Sunday, June 19, dying five days after entrance to the hospital and on the tenth day from the onset of symptoms.

During these five days he had a fever of a remittent type, varying from 100.6 degrees in the morning to 103 or 104 degrees in the afternoon, the records being axillary. There was no pre-agonal rise. The pulse at first was regular and relatively slow, often being found below 90 though the axillary temperature was as high as 103 degrees. During the last thirty-six hours the pulse became more rapid, averaging about

124. The bowels were moved by enemata. Several times he urinated involuntarily; once he had to be catheterized. He never vomited after admission to the hospital. He gradually became wildly delirious and at four on the afternoon of the day he died the nurse recorded a "spasm lasting about one quarter of a minute." On the morning of the 17th his respiration was rapid, forty per minute. Numerous moist râles were heard over both chests and a patch of dulness with broncho-vesicular breathing was made out in the left lower lobe, posteriorly. He coughed up a sero-purulent material. Just before death the respirations were for several hours between 70 and 80 to the minute. The petechial spots faded somewhat before death, no new ones appearing. There was no herpes. No paralysis was at any time made out. No foci of suppuration could be found.

The clinical diagnosis was acute epidemic cerebro-spinal meningitis, broncho-pneumonia.

The autopsy was made twenty-four hours after death, and I am indebted to Dr. Hektoen for the abstract of the protocol and for the cultures and stained specimens of the micrococcus which I exhibit.

Autopsy twenty-four hours postmortem, by Drs. Hektoen and Freeman. Anatomic diagnosis: Acute purulent leptomeningitis associated with the diplococcus intracellularis; bronchitis and hypostatic pneumonia; cloudy swelling of the solid organs.

Abstract of the protocol (No. 532): A well developed, well nourished thick-set man; pronounced lividity; brownish spots in skin over abdomen.

Scalp and skull normal; the entire cerebral leptomeninx is infiltrated with a thick, yellowish, purulent fluid which is especially marked about the posterior margins of the cerebellum. There are no miliary tubercles to be seen. The amount of cerebro-spinal fluid is small but the lateral ventricles contain quite a quantity of purulent fluid which in the horns becomes a thick, yellowish pus. The walls of the ventricles are soft. The ears, orbits, sphenoidal and frontal sinuses are normal. The nose could not be properly examined. There is exudate around the upper end of the spinal cord, but the spinal canal was not opened.

The liver and the kidneys show cloudy swelling; in the kidneys the glomeruli are prominent. The heart muscle is friable and flabby. In the left lung the bronchi contain muco-pus; the posterior parts of both lungs are congested and heavy; in the posterior part of the left lung are large areas in which the substance is solid, deep-red, and rather homogeneous on the cut surface. The other organs are normal.

The bacteriologic examination: The smears from the meningeal exudate show a minute coccus, occurring often as a diplococcus, and free as well as in the interior of polymorphonuclear leucocytes; this coccus has no capsule and destains by Gram's method. The exudate is very rich in leucocytes, many of which show evidences of disintegration; large, uninuclear cells also occur, but these are few.

Glycerin-agar and serum (Löffler) tubes inoculated with the meningeal exudate and the ventricular fluid show after twenty-four hours in the incubator a number of minute, dew-drop like colonies which (in the agar medium) have a pearly, translucent appearance; their outline is circular and well defined, the central parts brownish under the microscope; these colonies consist of cocci, in the form of heaps, pairs and fours; there are no chains; they are promptly decolorized by Gram's method. One or two larger colonies in one tube of glycerin-agar and one of serum were found to be the staphylococcus aureus and looked on as due to contamination. Otherwise these cultures were pure.

Inoculation upon new tubes of agar and serum and also in bouillon gives rise to a quite rich, typical growth which corresponds in all essentials to the descriptions of the diplococcus intracellularis meningitidis by Councilman, Wright and Mallory except that in the glycerin-agar tubes a considerable diffuse growth in the form of a very delicate film developed as well as the typical colonies. The authors quoted lay much stress on the absence of any diffuse growth of the organisms obtained from the cases that form the basis of their extended study.

About 1.5 c.cm. of the ventricular fluid was inserted into the abdomen of a guinea pig; the animal seemed a little sick but is still alive and apparently not very ill forty-eight hours afterward.

From the heart's blood and from the lungs cultures show staphylococcus pyogenes albus and bacillus coli communis; the spleen, liver and kidneys c ntain the colon bacillus. The histologic study of the organs is not completed.

The acute onset with headache, backache and vomiting, the rigid neck, delirium, the pulse slow regardless of a high temperature, the absence of splenic tumor, the petechial rash, make a picture of meningitis wholly unlike the tuberculous form, unassociated with primary pus foci and clinically resembling the epidemic variety. The finding in the meningeal exudate of the organism first described in 1887 by Weichselbaum, and later especially in the last few years identified by many as the specific cause of epidemic meningitis, its absence from the viscera would seem to furnish conclusive evidence of the nature of this case and to prove the first proposition that a case of epidemic cerebro-spinal meningitis has occurred in Chicago and has been partially identified as such.

For the proof of the second proposition, that an epidemic of meningitis exists in Chicago, I shall advance the oral testimony of many physicians who have told me of cases of meningitis that have recovered, the recovery of a case of meningitis being one of the strongest proofs that the disease is not due to the tubercle bacillus or to the ordinary pyogenic organisms, but to the diplococcus intracellularis. And I shall also give the abstracts of the following cases of meningitis seen by myself since Jan. 1, 1898, to show that an unusual number of cases answering to the epidemic form have been met with, in two of these there being recovery:

Case 1.—Child, 2½ years, seen with Dr. A. C. Cotton, Jan. 17, 1898. Headache, fever, vomiting and symptoms suggesting tuberculous meningitis. Remission in symptoms. Later, return with coma and death. Whole duration of illness about three weeks.

Diagnosis: Meningitis, either tuberculous or the mild remittent type of the epidemic form.

Case 2.—Adult, male. Convalescent from croupous pneumonia. Meta-pneumonic inflammation of right ankle joint and of neighboring tissues. Gradual improvement. Suddenly developing headache, vomiting, delirium, retraction of neck, fever. Death in twenty-four hours. Diagnosis, probable meta-pneumonic meningitis.

Case 3.—Seen with Dr. E. E. Prescott, March 13, 1898. Boy, 5 years, acute, excruciating headache, child beating head and pulling hair on account of pain, marked rigidity and retraction of neck, pain on moving neck or back, temperature 104 degrees, pulse very variable. Passed from my observation but I was later informed that a period of marked improvement and a pyrexia was followed by a return of headache, fever, etc., but that finally after about four weeks the boy seemed quite

well. Six weeks after the onset he was still in good health. Original diagnosis was a typical tuberculous meningitis. Without doubt this was a case of epidemic cerebro spinal meningitis.

Case 4.—Child of 3 years visiting in Chicago from Boston. Poor appetite, slight fever, cross for a few days. When seen March 20, 1898, quite dull and drowsy. Temperature 100 degrees. Two days later slight improvement. Then low fever from 99 to 102 degrees. Stupor, Cheyne Stokes respiration, abducens paralysis, unequal pupils, muscular twitchings and rigidity and death.

Diagnosis: Tuberculous meningitis.

Case 5.—Female child 2½ years, seen with Dr. Becker, March 24, 1898. A few days before, headache, vomiting, rapid respiration, high temperature. When seen in consultation comatose, no paralysis, rapid respiration, consolidation of upper lobe of lung. Death same day.

Diagnosis: Pneumococcus, cerebro-spinal meningitis though possibly of epidemic form with secondary pneumonia.

Case 6.—Adult male with old endocarditis producing aortic regurgitation. Cerebral embolism with right hemiplegia and aphasia. After being in hospital several weeks convulsions oft repeated, temperature, conjugate deviation of eye, coma, death.

Autopsy: Aortic regurgitation, old cerebral embolism with secondary softening, acute meningitis with purulent exudate; no primary pus focus. Failure to obtain cultures.

Diagnosis: Probable epidemic cerebro-spinal meningitis.

Case 7—Seen with Dr. S. A. Hemmi, March 8, 1898. Child of 2 years in coma. Moderate temperature, early history indefinite, but suggestive of tuberculous meningitis. Two other children previously dead of brain trouble. Death.

Diagnosis: Tuberculous meningitis.

Case 8.—Seen with Dr. T. A. Davis May 1, 1898. Male of about 20 years. Onset with headache, pain in back and abdomen and vomiting, suggesting at one time appendicitis. Later excruciating headache, rigid neck, edematous and reddened area on dorsum of left hand (culture from this negative). Remittent temperature with much irregularity, pulse variable. Remission in symptoms, then return, with opisthotonos, delirium, rapid pulse; death after about four weeks.

Final diagnosis: Epidemic cerebro-spinal meningitis.

Case 9.—Seen with Dr. C. D. Sharpe, May 7, 1898. Male about 22 years. Felt rather poorly on retiring May 5, but went to work next morning, May 6. Left work on account of pain in back and head. Saw doctor at office; temperature 102 degrees. Ate supper; in night vomited, headache severe, grew stupid. When seen in morning was comatose and hemiplegic, temperature 103 degrees, pulse rapid and weak, involuntary discharges. Later history not obtained as yet.

Diagnosis: Epidemic cerebro-spinal meningitis of fulminating type.

Case 10.—Child of 4 years seen with Dr. DeBey June 9, 1898.

Child taken suddenly four weeks before with vomiting, headache, delirium, retraction of neck, convulsions. Diagnosed by doctor as meningitis. Fever lasted about ten days; had disappeared when I saw the child. There was no complaint of pain, no rigidity of neck, but complete deafness. Child extremely cross and irritable. Great emaciation. To day, June 23, Dr. DeBey reports condition as practically the same, though emaciation and weakness are more pronounced.

Diagnosis: Epidemic cerebro-spinal meningitis.

Case 11.—Case just reported with diagnosis proven as epidemic cerebro spinal meningitis.

Case 12.—Adult male entered Presbyterian Hospital June 22 with diagnosis of typhoid fever with meningeal complication. From intelligent patient and from wife learned that onset was rather sudden two weeks ago with chill, intense headache and vomiting. Two nights later was delirious, as well as the day following. Temperature said by doctor to have been 104 degrees. No good sleep for these two weeks on account of severe headache, though other symptoms have improved. No spleen or other earmarks of typhoid. Temperature in evening 101 degrees.

Diagnosis: Possible mild case of cerebro-spinal meningitis.

Of these twelve cases, I believe two were tuberculous (4 and 7) in character, two were probably of pneumococcus origin (2 and 5). The diagnosis in case 1 may be questioned, though the phenomena are explained as well on the supposition of the epidemic form of meningitis as on any other. The case of the hemiplegia, case 6, was probably of the epidemic variety. The cases 8 and 9 are excellent examples, the one of the subacute form with remissions, the other of the fulminant variety. Case 12 is a possible mild subacute case. The cases that recovered, cases 3 and 10, were certainly cases of meningitis; their history is typical of the epidemic and their recovery an almost positive proof that such was their character. In case 11 the proof is conclusive. In other words, of twelve cases of meningitis seen, one is proven of the epidemic variety by bacteriologic examination; two by the clinical history and fact of recovery; two by the clinical history and exclusion of other forms; three are probably of the epidemic variety, though this diagnosis might be questioned; two were probably tuberculous; two probably pneumococcal.

That my experience in meeting with an unusual number of cases of meningitis is not unique is shown by the fact that there is current comment among physicians on the frequency of meningitis in Chicago, and that not a few cases recover. And in other parts of the country cases are reported. Boston has had an epidemic that has furnished the basis for Councilman's report with 35 autopsies. Baltimore is furnishing its quota to the wards of Johns Hopkins Hospital; the army surgeons are meeting with cases among the soldiers. A physician practicing in a country town in Iowa told me three days ago that he had seen six cases of meningitis in about three months and that some had recovered.

This being the fact we can be more guarded in our diagnosis and prognosis in our cases of meningitis. And we should, when in doubt, put our diagnosis on a surer basis by attempting to obtain the organism by lumbar puncture, a procedure regarded as without danger in this class of cases and as furnishing us in the majority of instances, when done early, with a sure means of determining the etiologic factor in the case, which knowledge influences materially the prognosis, and it is to be hoped, at some near day, the treatment.

SOCIETY PROCEEDINGS.

Associated Health Authorities of Pennsylvania.

Fifth Annual Meeting held at Lancaster, Pa., May 18 and 19, 1898.

(*Concluded from page 1522.*)

SECOND DAY.

The report of the Executive Committee by Dr. Lee, detailed the doings of that committee to provide for this meeting, the change of time and the arrangement to a visit of inspection to the Vaccine Farm at Marietta conducted by Dr. H. M. Alexander. It mentioned the almost total want of attention to the meetings by the local boards of health, their unwillingness to subscribe to the funds, and the need of money to pay the indebtedness to Dr. W. B. Atkinson for publishing *Public Health* and the issue of a circular appealing to all to aid the Association by contributing yearly. Also it alluded to the success of the New Jersey State Sanitary Association and the Maryland Public Health Association, and presented the Constitution of the latter as an idea of how to obtain members in the want of better interest on the part of the local boards.

After some discussion on motion a committee was appointed to report to this session some plan of amendment of the laws of the Association by which to add to the membership, etc.

The Committee on Legislation reported efforts to obtain legislation by the State Legislature for several sanitary matters, all of which had failed owing to the want of money in the State treasury from the burning of the State capitol.

The Committee on Publication reported as to the need of money to continue the work of the Association, and the great desire on the part of all to keep the publication of the Journal from lapsing. Not 10 per cent. of the local boards had joined the Association, mainly owing to the lack of funds, as the vil-

lage councils refused to vote them funds for any purpose. The committee commended the work done by the Journal and the courtesy of the editor in performing the work without hope of compensation.

Dr. D. H. Bergey, first assistant in the laboratory of hygiene, University of Pennsylvania, read a paper entitled:

POLLUTED WATER SUPPLIES; THE NECESSITY FOR LEGISLATIVE RESTRICTION OF THE POLLUTION OF SURFACE WATERS THROUGH THE SEWAGE OF TOWNS AND BOROUGHS DRAINING INTO PONDS AND STREAMS THAT SERVE AS SOURCES OF WATER-SUPPLIES FOR OTHER TOWNS AND BOROUGHS.

He said the frequent complaints made to the State Board of Health, of polluted water-supplies and the almost invariable verification of the truth of such complaints by careful analyses of such waters, make it necessary for the State at large to devise means for abating these nuisances in an effective manner. The water supplies of many towns and cities are grossly polluted at the present time. Perhaps the most notable example of this pollution, not only of the State but the whole country, is that of Philadelphia. There are many other cities and towns in the State whose water supplies are grossly polluted to such an extent that they are unfit for use as water-supplies without previous purification of the water. Wherever the water-supply of a town is derived from these streams, filtration of the water is necessary in order to protect the health of the community against water borne diseases. The necessity for legislative restriction of the pollution of surface waters does not rest, primarily at least, upon the fact that pollution of these waters will require their filtration to render them fit for domestic use. Such legislative restriction is called for more particularly from the fact that some of these streams are now, or were rapidly becoming, direct menaces to the public health of the communities through which they flow. It is no longer to be expected that these surface waters can be maintained in such a condition of purity as to serve as sources of water supplies without previous purification of the water. The drainage areas of most of the water courses are already so thickly populated as to render this out of the question, so that aside from the drainage of towns and boroughs along their course, there is sufficient polluted material gaining entrance thereto from the thickly settled rural districts to continue to render the water unfit for domestic use unless purified. In order, therefore, to prevent these water courses from becoming direct menaces to the health of the communities through which they flow, it is necessary to restrict the pollution through sewage that is now taking place. The only way, it seems to me, that this can be accomplished is through the enactment of laws prohibiting such pollution. Such laws should prohibit the entrance of all new sewers into any water-course which, in any part of its course, serves as a source of water supply for another town. This law should also demand that whenever practicable the drainage of towns now draining into these towns shall be subjected to some reliable method of purification in order to render it innoxious before entering the streams. In order to lessen the expense and to render the purification of sewage more efficient, it is suggested that a number of towns be combined together into a single drainage area and erect a single purification plant for the entire area. Attention is also called to the objectionable character of manufacturing waste and the signal manner in which it increases the pollution of streams. So far, the States that have secured important legislation restricting the further pollution of streams, somewhat along the lines of the Rivers Pollution Act of England of 1876, are Massachusetts, New York and West Virginia. So far legislation in our own State has not been secured to this end, though several bills have been introduced into the State legislature since 1891 tending to bring this about. It is urgently demanded that such legislation be secured in Pennsylvania, on the strength of the knowledge already obtained with regard to the grossly polluted condition of our several streams.

Dr. Bergey's paper was discussed by many of the members, and on motion, the acts offered in 1891 and 1895 were again referred to the Committee on Legislation and they were instructed to urge their adoption by the legislature at the coming session of that body.

After allusion to the lecture of Professor Rothrock, the following was unanimously adopted:

WHEREAS, The Associated Health Authorities of Pennsylvania have already placed upon record their opinion that the best interests of the commonwealth would be subserved if the State should become the possessor of extensive areas at the head waters of our principal streams, and

WHEREAS, Up to this time no direct action has been taken to secure these lands which are so essential to the future of the Commonwealth; therefore, be it

Resolved, That we again place ourselves upon record as endorsing for this State a system of forestry reservations, such as have proven to be of so much value to the health and commercial interests of the State of New York.

Dr. Thomas Turnbull, Assistant Bacteriologist of the State Board of Health, read a paper entitled

SUGGESTIONS FOR LEGISLATION IN THE INTERESTS OF A MORE COMPLETE SYSTEM OF SANITARY ORGANIZATION OF THE STATE.

He referred to the menace to cities and towns throughout the country districts, in the absence of any form of health authorities, all who were suffering from any form of contagious diseases were not prevented from being at large and thus constantly distributing the infection to others. He quoted the common belief that measles, whooping cough, even scarlet fever, were regarded by the people as not of import, hence the objection to report them and often the non need of any medical attendance. Thus these contagions were being carried everywhere, and thus were epidemics kept up. It was a prime necessity that such legislation should be enacted that would prevent this which was an outrage upon the people. He also alluded to the necessity for a codification of the existing health laws of the State, and quoted the admirable system now existing in the State of New York, which he held up as a model for Pennsylvania.

Dr. B. Lee read a paper on

TRANSPORTATION OF THE DEAD.

He said this is not a safe thing to do unless under certain restrictions. A physician's permit is not sufficient, boards of health alone should give the permission, and these only after very careful consideration. It is not a question of proper respect for the dead, but of health for the living. In our affection for the dead we are apt to forget the other and sanitary side. The danger is greatest in the country, where there is no supervision, but there the hold is to be had in the transportation companies, who are coming to understand the risk to the health of their employes and the trouble the law will give them. Diphtheria, he thought might be placed upon the free list of not absolutely contagious diseases, the use of formaldehyde doing away with the danger. The examination and registry of the embalmers and the responsibilities of undertakers were touched upon, the certainty that those who prepare the bodies understand their business being essential. The opposition by the members to the placing of diphtheria on the free list was very emphatic among those who discussed the matter, but Dr. Lee believed that if it could be done, if the concession could be safely made, it ought to be done.

Crosby Gray of Pittsburg thought in place of lessening the list, scarlet fever and measles should be added to it.

Dr. M. L. Davis of Lancaster then addressed the Association upon

THE DISPOSAL OF GARBAGE,

illustrating his remarks by pictures on the screen. He said: We would feel like apologizing to you for referring to the importance and necessity of the sanitary disposal of garbage were it not a fact that in the closing days of the nineteenth century the great majority of the centers of population are without any means or system for this purpose other than to remove it from the most objectionable place in or near the buildings to one a little less undesirable because more out of the way. The great State of Pennsylvania, with its 6,000 000 inhabitants, has forty nine cities having more than 10,000 people; and in only eight of these forty nine cities have any other means been adopted for the disposition of garbage than by dumping it at some unfrequented place. The practice for many decades has been for inland cities to convey their garbage to a dumping place, while seaport cities loaded it on scows, which by the terms of contract were to be towed ten miles out to sea and the cargo then thrown overboard; this we presume, was sometimes carried out, but we know to a certainty that New York Harbor as well as Delaware Bay has been the depositing place for many a barge load. Philadelphia, until within the last five years, has emptied all of its sewage and much of its garbage into the Delaware and Schuylkill Rivers; the solid portions have deposited upon the bottom of the channel until it became too shallow for large vessels to enter the port, and we now witness the interesting spectacle of the United States Government expending millions of dollars to remove the filth which Philadelphia dumped in front of her own door.

Philadelphia, by this irrational and unwise action, had cut off the possibility of large vessels entering her port, thereby losing valuable shipping trade. Inland cities are doing just as irrational a thing, but in a different direction. They deposit their garbage in some old abandoned stone quarry, an abandoned

sand pit or "sink hole," there to decay and poison the air by the fumes arising from its decomposition, and the water-supply when well water is used by the filthy material carried into the ground by rain, finally finding its way into the wells.

It is interesting to note how the cities of America dispose of their garbage; an investigation some time since by Mr. Randolph Hering of New York into the methods employed by 150 American cities, elicited the following: Forty-six cities disposed of it by filling or plowing into the land; 14 by dumping it into the sea, lakes or large rivers; 43 cities employed it to feed animals; 17 employed reduction plants, recovering the grease for soap-making and making the residue into fertilizers; 30 disposed of it by burning in various kinds of garbage furnaces. Thus, while 103 of the cities investigated disposed of their garbage in dangerous and improper ways, only 47 adopted safe methods. It is only of late years that any scientific method of garbage-disposal has even been sought for.

The rapid advancement of sanitation, the establishment of boards of health in cities, enforcing greater cleanliness, made a demand for a better method of disposing of this dangerous refuse and nidus of disease-breeding germs. The law of demand and supply came to our relief. The inventor's mind was turned to the subject and as the substance to be destroyed was impure, naturally the only sure purifier in nature, heat, was suggested. Various methods were devised to apply the heat in the best possible manner to burn the material to be disposed of.

It is our desire to explain to you how this can be accomplished in the cheapest and most cleanly manner, by considering the various methods of disposal plants and their systems of operation.

Garbage, in this sense, should be confined to kitchen waste, that is, the rinds of oranges, bananas, apples, peaches, watermelons, cantaloups, waste scraps of bread, etc., and the many things of an offensive nature that accumulate in a kitchen and about a house, which are capable of undergoing putrefaction or carrying the germs of disease: the refuse of market stalls and the establishments for sale of fish, fruit and vegetables. Other substances should never be placed with garbage, as they either require separation from the garbage in some processes, or in others take the place of an equivalent amount of destructible material, and thereby encumber the economic destruction of the garbage proper.

In referring to the decomposition of garbage as being dangerous, we do not wish to be understood as advocating the theory of some that disease germs are produced by such decomposition, as we firmly believe that the particular germ of every disease which afflicts the animal body is placed in or received into that body in an embryonic state, to be developed, and to the processes of development and reproduction of its kind are due the manifestations of the disease to which the germ belongs. For example, in typhoid fever the germ enters the alimentary canal, the eggs lodge in Peyer's glands and there develop, and it is the irritation produced by this growth which causes the symptoms of the disease. That the decomposition of garbage or the decomposition of any other substance will produce these germs we do not believe; but filth of any kind, and putrescible filth especially, furnishes an excellent nidus for such germs, and no better material for their collection and preservation can be found.

The amount of garbage produced by different cities varies very much, dependent largely upon location, modes of living, employment, etc. American cities, owing probably to more lavish modes of living, produce much more garbage than European cities of the same size. Cities located as those along our Jersey coast, where transportation facilities are such that one or two hours' time will deliver at their doors any products from Philadelphia and New York, this, and the class of people who frequent such resorts, cause large quantities of perishable vegetables and fruits to be used, hence a very much greater amount of garbage will be produced than in inland cities of the same size.

The average daily amount of garbage produced by American cities is one half to one ton for each 1000 population. This can be taken as a safe basis to calculate from, as only in rare instances will it fall below or rise above this amount.

The following tabulated amounts of garbage collected from the cities named prove the correctness of this estimate:

Buffalo	per capita, 0.245 pounds per day.
Boston	per capita, 0.946 pounds per day.
Wilmington	per capita, 0.805 pounds per day.
St. Louis	per capita, 0.277 pounds per day.
New Bedford	per capita, 0.890 pounds per day.
Cincinnati	per capita, 0.566 pounds per day.
Philadelphia	per capita, 0.832 pounds per day.
Lowell	per capita, 0.408 pounds per day.

Two methods of disposing of garbage are being adopted at the present time, to the exclusion of others; during the last five years all the cities which have abandoned their insanitary modes of disposal have adopted one or the other. The one process is known as the utilization process, and the other, by burning it in a furnace constructed particularly for the purpose, is misnamed the cremation process. We will consider first the utilization process. The idea that there was material in garbage which, if reclaimed, would be of value, was the incentive which developed this method of disposal, with a view to make a fortune out of the product. There are in use two kinds of utilization processes. In the one kind benzene or naphtha is used to dissolve the fat contained in the garbage. Among the principal ones of this kind are the Merz and the Pierce. The Preston, Halthaus and Arnold are purely mechanical processes, no chemicals being used. The machinery and appliances of both systems are practically the same, except in the one a naphtha tank. The special machinery consists of large iron tanks, fifteen feet high by five in diameter, provided at the top and bottom with means to be closed steam tight; they each hold seven tons of garbage, and upon their number depends the capacity of the plant. Presses to press out the grease, dryers to dry the solid portions, fume destroyers, grease-extracting tanks, naphtha tanks and condensers, screens, mills for grinding the coarse material after having been dried, together with boilers, engine and the many utensils required to operate a plant having so much machinery. The iron tanks which receive the garbage are called cooking tanks, extractors or digestors. As a description of one of these plants will suffice for most of them, we will describe the process the garbage goes through in such a plant. The garbage is conveyed to the reduction plant by carts, which are weighed upon scales; the cart then goes to the rear of the building, when it enters and dumps its load into a large pit, where two men stand in the foul mass and fork it into elevators, which convey it to the digestors; these men separate the tin cans and other substances found in the garbage. A visitor to a plant at Pittsburg describes the process thus from this pit: One line of these hoppers, the descending one, is empty. It turns upward and gathers up a great wad of the reeking refuse. Working like the belt of an engine, but slower, the hoppers carry their load up and come down empty. It is carried up to the third story. Round the rear of the building you come to a flight of stairs leading up to the second and thence to the third story. Here is where the process of reduction is begun. In the third floor room you realize that this place is less a garbage furnace than it is an odor-destroying institution. The process of cooking the refuse is simple and requires little, though awkward lumbering, machinery. The devices for carrying off any objectionable smells and holding them from ascension into the air are numerous and complicated and occupy most of the space of the room. There are fans and pipes and ducts and furnaces. A single narrow building where the digestors might be stored would be sufficient to get rid of the garbage. A great square building with many attachments inside and out is necessary for the destruction of the odors.

When the hopper is filled and ascends to the ceiling of the third floor its load is emptied into a duct. Carriers bring it along the roof until it is over one of the huge digestors. These are huge cylindric vessels, probably fifteen feet high and five or six feet in diameter. Each of them is capable of holding seven tons of garbage. They are filled every four hours and are working night and day. The top of the digestor is just under the duct that carries the material from the hoppers. This gives them some six feet on the third floor, while the under portion is upon the second floor and extends down to a vessel, technically known as the dryer.

The room in which the digestors are filled is as clean as an office. Attendants are kept busy about the big cylinders, as there are bits of garbage that can not be prevented from falling out when the hoppers empty their load. The boys have brooms, and as a bit of stuff falls on the floor it is swept up and put into the vessel. Every window of the room is open. Going to one of these windows you find it peculiar that there is only the draught of air inward. Not a breath goes outside. Yet the windows are open all about the room, and there are many windows. This is explained by the big fan and air-pipe. Coming from the air-pipe are numerous cylinders extending from the pipe about halfway to the floor. These end in a funnel-shaped spread, and a hand placed at their mouth finds the air sweeping up into them. It is absolutely impossible for a disagreeable odor to get outside the windows. The fan is capable of carrying away 75,000 cubic feet of air a minute.

But to go on with the garbage. The seven-ton digestor is full. The steam-tight and air-tight doors at the top are closed after having admitted the stuff. There are similar doors at

the bottom of the digestors. They are so arranged that they can easily be opened and shut. The digestor is supported on a huge iron frame, and the fact that simply opening the doors at the top fills them and opening at the bottom empties them shows the facility of the work. It can be worked at both ends in a moment. Any bad air that may emanate while this process is going on is well taken care of by the big fan. There are valves and pipes arranged so that the steam for cooking may be admitted into the cylinder.

In many of the garbage furnaces there is a step here in the reduction that is not taken in the Pittsburg establishment. It is the crushing. Perforated cylinders are sometimes filled with the cooked and charred stuff now called tankage instead of garbage, and an immense pressure is applied to it. This squeezes out much of the water and grease in the tankage. The grease is utilized and considerable income, about $500 a day, would be derived from this grease here. An estimate places the amount of grease that can be obtained from 400 tons of garbage, at that figure. But it is not all grease that is derived from the pressing process. Much of it is foul, rank water. This is the reason the pressing is omitted. The drinking water of the city is obtained from the river, and were the tankage pressed the water would be drained off into the river. Where they have an ocean in which to empty the dirty liquid the pressing can be done advantageously. Instead of pressing the tankage, therefore, it goes immediately to the dryer. There any water or moisture that still remains is vaporized or absorbed. From the fourteen digestors of the factory the tons of garbage are reduced greatly, and seven dryers hold the tankage. Each dryer receives about four tons. The dryers are steam-jacketed cylinders in which huge arms are constantly moving about. They stir up the contents and submit every portion of it to the heat, so that it is thoroughly dried. The heat, which is applied through the cylinders, is the same in every part. The garbage in this process is much broken up and disintegrated.

It is from the dryers that much of the objectionable odor comes. In the process the water and grease of the tankage is bound to be converted into vapor. This is evident in the fact that after the digestor and the dryer have finished with the garbage only about 20 per cent. of the stuff remains. There is 80 per cent. odor, and such a vaporization might, if allowed free access to the atmosphere, bring misery to many noses and cause the condemnation of many Christian souls. So, heroic measures are used on the dryers.

There is a vacuum-pump next the engine room in the rear of the building. It is a pretty and powerful little arrangement. There is a big cylinder, and the pump by constant suction establishes in the cylinder a vacuum. Attached to the dryer are pipes and ducts similar to those upon the third floor. These pipes connect with the vacuum-pump and immediately the vapors take form and make for the aerial quarters they are seized, drawn into the pipes and brought along by the vacuum. None of the vapors can escape. This is evident, inasmuch as there is not a particle of odor in the room with the dryers.

When the dryer has done its work with the tankage the work is over so far as the garbage plant is concerned. There are little carts under the dryers that have air-tight tops fitted on them. These carts are somewhat similar to those the street cleaners drag about, scarcely a deviation from the ordinary fruit vendor's push-cart. From the dryers the carts take the tankage back to the rear of the building, adjacent to the pit; just where it came from a few hours previous reeking, foul-smelling, filthy. The load that the cart has is again elevated. There is a sort of permanent crane upon which the tankage is hoisted. Freight cars are run under this crane and all that remains of the garbage is dumped into the cars, a charred mass.

Of the possibly 100 tons that went into the digestor there are about twenty tons left to be converted into fertilizer. The tankage is crushed, ground up and chemically treated, and its end is first-class fertilizer.

There are three furnaces that are used to get rid of the vapors. Some of the fumes that come from the dryer are susceptible to condensation by a spray of cold water. The greater part of them, though, must be destroyed by heat. The vapors from the pipes are usually sent through a spray of cold water, and some of the gases taken away. The remainder goes into the incinerating furnace. There are three of these furnaces, all with huge boilers. Inside the cylinders, the pipes are coiled up until many feet of pipe are there. The gas flame is applied to these coils. It is a process similar to distillation. The vapors are run through these pipes and subjected to an intense heat. They lose their identity there in decomposition. They are separated and destroyed. At the side of the engine there are exhaust pipes. Opening the exhaust, steam and water are discharged. In a few moments the odor is perceptible, and it grows more intense all the time. It is highly disagreeable, resembling hydrogen sulphid, the most disgusting chemic compound known. The odor is somewhat like putrefied cabbage boiling. By placing a handkerchief at the exhaust the odors and vapors will condense upon it, and an idea obtained of the insurrection that would arise were the vapors turned on the air. But when the incinerating furnace has finished with the vapors there is absolutely no odor left. There is therefore none to ascend to the bluff above or to cause trouble. From the pit in the rear it is possible that some may ascend, but that is the only place, and the effect is inconsiderable. This is the odor that bluff residents occasionally smell. The huge fan at the top can cause a draught that sweeps the odors from all the floors. It is on the third floor, and its effect is felt on the first. From the digestors all odor goes into the pipes, and the same may be said of the dryers.

The outlay for the operation.—There are thirty wagons, each with a driver and a helper, and each with two horses. The driver gets $1.66⅔ a day, and the helper gets $1.50. About the works on Second Avenue the forty-five men employed at various salaries are from office boy to superintendent. It is not unfair to place the wagon men at $30,000 and the others at $20,000. There is the sum of $30,000 still to be used in the garbage furnace alone. Of the $30,000 that remains, the horses must be kept, the factory must be kept up and incidental expenses must be borne. Incidentals cover a multitude of sins. But whatever else can be said of the garbage plant its efficiency can not be denied. It is visited by officials of other cities, and is called perfect.

To summarize, the utilization method is to receive the garbage in a pit, separate tin cans and other solid material from it, convey the garbage proper to the digestors, where it is treated by a cooking process by steam alone in the one case and in the other by steam and naphtha to extract the grease, the pressing out of the liquid, drying of the solid portion and grinding for fertilization, and the distillation of the naphtha to reclaim it.

The burning method of disposing of garbage is accomplished by two methods; the one utilizes the carbon in the garbage as fuel and the other does not. These furnaces are of the horizontal type; when the garbage is dumped through openings upon a grate a fire at the end furnishes the heat to dry and burn the garbage. A second fire in or near the stack destroys the odors from the burning garbage.

Let us consider the cost to the different cities using utilization or burning. Milwaukee pays $1.48 per ton to have its garbage disposed of, St. Louis $1.32 per ton, New York $89,000 per year, Pittsburg $80,000 per year; this does not embrace collection.

That the destruction of garbage is desirable by suitably built furnaces in the vast majority of cities is unquestionable.

The horizontal furnaces have burned of late, at Wilmington, 500 tons of garbage with ninety tons of coal, or 39.9 cents worth of fuel to destroy a ton of garbage. The Davis furnace has burnt forty tons of garbage with one ton of coal, or a record of 6 cents worth of coal for each ton of garbage; including the fireman's wages would only amount to, for a day's burning of forty tons, $1.50 fireman and $2.15 one ton of coal, or $3.65 besides the interest of the plant. Whilst the reduction plants want for the same work $52.80, besides the process of reduction is not only more expensive, but the separation of the offensive material is repugnant.

Before illustrating the different systems we would call your attention to the subject of the domestic disposal of garbage. There are many towns too small to use a garbage plant, but when the disposal of garbage is an important item we might show how this can be done in the ordinary stove or range.

The special committee reported an amendment to the laws allowing any one interested in sanitary matters to join the Association on payment of one dollar yearly, with all the rights of any members, and the addition to the name of the Association of the word sanitarians, making it "The Associated Health Authorities and Sanitarians of Pennsylvania." These amendments were unanimously adopted.

Dr. LEE offered a humorous resolution urging the removal of the constant menace of the filthy condition of Cuba by the proper administration of certain articles. After some discussion on the importance of such a matter a resolution was presented by Dr. Lee.

WHEREAS, In consequence of entire neglect of the Spanish authorities in the Island of Cuba to inaugurate and enforce such sanitary laws and regulations as exist in civilized countries, the diseases of smallpox, yellow fever and leprosy constantly prevail unchecked in that island, and

WHEREAS, In consequence of the proximity of Cuba to the United States and the intimate relations between the two countries, the condition referred to constitutes a constant men-

ace to the public health of this country, involving the most painful anxiety, considerable pecuniary loss, and in repeated instances serious loss of life, therefore

Resolved, That no settlement of the pending difficulties between the United States and Spain will be satisfactory to the sanitarians of this country which does not insure to the United States the absolute control of the sanitary administration of the Island of Cuba.

This was adopted by a unanimous vote.

The officers chosen were: Crosby Gray, Pittsburg, first vice president; Moritz G. Lippert, C. E., Phoenixville, second vice-president; J. B. Tweedle, Weatherly, third vice president; Wm. B. Atkinson, Philadelphia, secretary; Jesse C. Green, D.D.S., West Chester, treasurer.

The Association adjourned to meet in 1899 at the call of the Executive Committee.

German Congress of Internal Medicine,

April 13, 1898.

The President in his address referred to the campaign against Vivisection, which has been revived in Germany, and mentioned as an instance of the non-antagonism between vivisection and love of animals, that the physiologist, C. Ludwig of Leipsic, is president of the Society for the Prevention of Cruelty to Animals. The first session was devoted to "Medical Education." A ten-semester course was advocated, with increased facilities for practical technical training in diagnostic methods, laboratory work and general therapeutic methods (dietetics, inhalations, hydro-, mechano-, electro-, balneo- and climatotherapeutics), with practical bedside courses. The internal clinic should be four semesters, ten hours a week. The folly of creating a special chair for any branch of internal medicine or therapeutics was emphasized. Leo announced, in his address on "Diabetes," that the new preparation by E. Büchner of crushed and compressed yeast, which while filtered free from cells still contains the zymosis, the sugar-splitting element, produces a remarkable curative effect on dogs rendered diabetic by being fed with a solution of sugar fermented with yeast until the sugar has vanished. The diabetes thus induced lasts several days, and produces great emaciation if long kept up. It demonstrates that the elimination of sugar in individuals after copious beer-drinking, is due to some toxic metabolic product of the yeast cells. Beer, therefore, should be avoided by persons inclined by heredity to diabetes or already affected. He urged periodic investigation of the urine and weight in diabetics by the physician, "not the druggist," to determine periodically the capacity for assimilation. The "Heat Production in Fever" was attributed by Krehl to the fever-producing substances in the circulation. An increased amount of organic albumin is decomposed, with the albumin molecule hydrolytically split. The albumoses thus formed, far advanced in hydration, enter the circulation and are eliminated through the kidneys. The products of this decomposition of the albumin affect the nervous system as a toxin, especially those points which regulate the innervation of the vessels and the giving out of heat. Less heat is given out and the bodily heat rises. Von Ziemssen secures much clearer views by making his fluorescent screen flexible to fit the contours of the body. He suggests that a cloth vest might be impregnated with the chemicals and fit still more perfectly.

The addresses on "Intestinal Antisepsis" and "Autointoxication" proclaimed the paucity of our knowledge on this subject and the worthlessness of all antiseptics for this purpose. They are only kept in vogue by the advertisements of the manufacturers. Only one or two voices were raised in dissent to this sweeping condemnation, which leaves only prompt evacuation of the contents of the stomach and intestines for our reliance in intestinal autointoxication. Boas remarked that it is usually accompanied by renal insufficiency, and that calomel acts upon both the intestines and the kidneys, while salicylic acid reduces abnormal production of gas. He is now studying the relations between the "oxyacids" and the excretions. Stern related the results of his investigation of calomel feces. They contained so much calomel that in the course of a few hours the bacteria in them were partially or entirely destroyed. Fürbringer also expressed his belief in the value of calomel as an intestinal antiseptic. Albu suggested that autointoxication may be due to spontaneous alterations in the physico-chemic relations in the blood and organic juices, caused by abnormal metabolic products, such as alterations in the osmotic tension. The parallel between exogenic intoxications and the autointoxications *par excellence:* diabetes, gout, anemia, suggests that they are more properly disturbances in the intermediate metabolism; intestinal autointoxication is quite different. Quincke suggests utilizing the antagonism that exists between different unicellular organisms, and cited his success in treating intestinal putrefaction (with excess of indoxyl and diarrhea) by means of pure yeast, 60 c.c., immediately after each meal. Sternberg announced that the accessorius is the motor and the cervical branches the sensory innervation of the sternocleidomastoideus. Van Niessen described a small streptobacterium which he has found regularly in the blood in syphilis and also in specific progressive paralysis and tabes. He ascribes a specific nosogenic importance to it in the probably complex etiology of syphilis. Trumpp asserted that cholera and typhus immune serum produce agglutination, which he considers establishes a connection between agglutination and immunity. It is not a mechanical phenomenon, but due to some effect on the walls of the bacteria, and immunity may be due to this same effect. Badt stated that 94 per cent. of his fifty-three cases of arthritis deformans were women, and in 80 per cent. of these, the affection had commenced with the menopause, to which he is inclined to attribute its etiology. The oöphorin tablet treatment recommended by Senator and others for the climacteric disturbances in the circulation seems indicated, therefore, in this disease.

SELECTIONS.

Medical Charity in New York.—Dr. Frederick Holme Wiggin of New York, presented to the recent Conference of Charities and Corrections, "An Historical Sketch of the Recent Movement to Restrict the Abuse of Medical Charity in New York." He said that the movement had been inaugurated about eighteen months ago by the efforts of Dr. Stephen Smith, recently president of the Department of Charities, and Dr. Landon Carter Gray, then president of the Medical Society of the County of New York, who showed that the ratio of those applying for medical aid had risen from 16 per cent. in 1860, to about 49 per cent. in 1895. A committee of the County Medical Society, consisting of gentlemen representative not only of the general medical profession, but of the larger teaching faculties in the city, were charged with the duty of investigating the question of the abuse, and if possible suggesting the remedy. They found no difficulty in proving the existence of a serious abuse, and consequently their efforts were chiefly directed toward seeking out the remedy. It did not take long to reach the conclusion that the evil was largely the result of a lack of proper methods of investigating the financial condition of those applying for medical relief, and that the Charity Organization Society considered it perfectly feasible to systematically investigate all applicants. The cost of such investigation, it was estimated, would be about $25,000 the first year, and about $5,000 each subsequent year. In the opinion of the Committee, another important factor in the production of the dispensary abuse was the system of charging small fees for the medicines and apparatus, thus leading many persons to feel that they were paying their way. As a result of this preliminary study of the question, the Committee felt convinced that the evil could be restricted by attention to these points, and also by making it a misdemeanor, punishable by a moderate fine, for a person to obtain, by reason of false representation as to financial condition, free medical or surgical relief at a dispensary. An effort was then made, by means of a circular letter, to secure the co-operation of the managers of the dispensaries, but although more or less definite replies were received from seventy-six dispensaries, it soon became apparent that it would be impossible to get the managers of all the dispensaries in this city to voluntarily agree to any general plan. The attitude of these managers was clearly presented in the report made to the legislature last January by the State Board of Charities, which says of them: "They apparently are not, and have never been in a temper to come to some mutual understanding whereby better conditions shall prevail. In a large degree, and for various reasons, they have become competitors in business to such an extent that it is probable that nearly half of the inhabitants of New York are now receiving practically free medical treatment." The original committee was soon reinforced by representatives from a similar committee appointed by the New York County Medical Association. As a new organization, known as the New York Society for the Advancement of the Practice of Medicine, had already introduced into the legislature a bill intending to rectify some of these abuses of medical charity, and as this bill contained a number

of objectionable features, its proposers were consulted, and persuaded to give their consent to the substitution of another bill that had been prepared. The main features of the latter or the first "dispensary bill" were: 1, forbidding the establishment of a dispensary in a drug store or tenement house; 2, requiring all dispensaries to be duly incorporated and to be licensed by the State Board of Charities; 3, providing that persons shall not obtain relief from dispensaries by false representations, and that a violation of this act shall be a misdemeanor; and 4, empowering the State Board of Charities to make rules and regulations, and to annul or suspend incorporations, and to revoke licenses. The bill having received the endorsement of the State Board of Charities, it was passed unanimously by both houses of the legislature, but did not become a law owing to the failure of the executive to approve it. Between this time and the opening of the legislative session of 1898, the subject was freely discussed, not only in the medical societies, but by both the medical and lay press, and the following medical societies endorsed the plan of appealing to the legislature to limit the abuse of medical charity: The New York State Medical Association, the Medical Society of the County of New York, the New York County Medical Association, the New York Medical League, the New York Society for the Advancement of the Practice of Medicine, the Medical Society of the County of Kings, the Kings County Medical Association, the Brooklyn Medical Society, the Brooklyn Medical Association and the Long Island Medical Society. Representatives of these societies formed a joint committee which, after much careful investigation, prepared the outline of another bill, which was milder in character, and which seemed to eliminate the features which had been considered objectionable in the previous bill. Before its representation to the legislature, this outline was submitted to the revision committee appointed by the Governor for the purpose of revising or preparing bills, so that they shall be constitutional, and shall not conflict with existing laws.

The essential points of difference between the second bill and this one were: 1, in the new bill the definition of a dispensary was limited to such institutions as derived their income, wholly or in part, from trust funds, public moneys or sources other than the individuals constituting the dispensary and the persons actually engaged in the distribution of its charities; 2, in the new bill the State board of charities was given control over dispensaries by empowering it to grant licenses to such institutions as, in their judgment, would be for the public benefit; 3, in the new bill, the board was given the power to revoke licenses for cause, after a public hearing, instead of, as in the previous bill, the power to annul the act of incorporation. It seemed to the framers of the measure that if the existing abuse of medical charity was to be controlled, the first requisite was an impartial body, which should control and make rules and regulations for the government of all institutions seeking to relieve the sick poor. Such a body is provided for by the legislature, under the constitution, in the State board of charities, and its powers are such that they would require to be but very slightly extended to allow this board to assume control and supervision of the dispensaries of the State by issuing and revoking licenses. This revised dispensary bill was very generally and favorably commented upon by the daily press at the time of its introduction into the legislature in the early part of the session. At first, the bill met with scarcely any opposition in the legislature, but when it was favorably reported by the committee on public health of the senate, to whom it had been referred, such vigorous protests were received by the chairman of that committee, that provision was made for a joint hearing of the friends and opponents of the measure, before the senate and assembly committee on public health. After full arguments on both sides, the senate committee reported the bill favorably to the senate, which passed it with only two negative votes; but the public health committee of the assembly failed to report the measure to the assembly, although vigorous efforts were made by its friends to secure a favorable report. The measure was therefore smothered in committee, and failed to become a law.

Operation for Hour-Glass Contraction of the Stomach from Gastric Ulcer.—Mr. Watson Cheyne has had an important case at the Kings College Hospital, of the above nature, with operation followed by recovery. The hour-glass condition of the stomach is not very infrequently met with at a necropsy, but is certainly rarely that it can be diagnosed clinically. The surgeon holds the opinion that the Heineke-Mikulicz operation which he performed was the most suitable under the circumstances. As more than three and a half months have elapsed since the operation the hope that the patient is permanently relieved seems fully justified. A married woman, aged 46, was admitted to the hospital on November 8. About six years ago she began to suffer with great pain in the hypochondriac region and in the right shoulder and, in fact, with all the symptoms of ulcer of the stomach with the exception that she had at that time no hemorrhage. She was treated for this condition by diet and in various other ways, and had suffered much from time to time, but latterly the symptoms had been those of obstruction. She was emaciated and feeble and had almost daily vomiting. Her diet had of late been entirely a fluid one. Examination showed a moderate amount of gastric distention that was not uniform. On listening with a stethoscope over the middle of the stomach region, a gurgling could be heard from time to time as if fluid was running through a narrow orifice, and Dr. Burney Yeo, who saw the patient in consultation, stated that in his opinion the case was one of hour-glass contraction of the stomach, resulting no doubt from an old ulcer. On December 1 a vertical incision was made over the stomach, in the middle line, about four inches in length, and when the peritoneal cavity was opened the stomach was drawn out of the wound; it was then found, as had been expected, that just above the center of the stomach there was an hour-glass contraction. The stomach, especially toward the cardiac end, was very considerably dilated and there was also some dilatation toward the pyloric end. The contraction was very marked and when it was laid open it was found that the communication between the two portions of the stomach was extremely small; as a matter of fact, a crow quill could hardly have passed through. There was a good deal of scarring and cicatricial tissue in the neighborhood and at the actual point of the contraction there was no mucous membrane at all. An incision was made through this contracted portion in the line of the stomach so that the ring of cicatricial tissue was divided transversely; this incision was extended into the healthy parts of the stomach for about one and a half inches on each side, and then the angles of the incision were brought together and the rest of the part sewn up, first with a few stitches which went through all coats of the stomach and then with a row of Lembert's sutures; in fact, the operation performed was identical with that employed in cases of contracted pylorus under the name of pyloroplasty. After the operation was concluded an opening was left between the two portions of the stomach, which could readily take a couple of fingers. The wound was then stitched up and the patient put back to bed; she was not very much collapsed after the operation. The wound healed by first intention and the patient went on very well. After about a fortnight she was allowed to have solid food. She was discharged on January 7, having gained eight pounds since her admission, and she stated that she felt better than she had felt for many years; this improvement still continues. She is still somewhat troubled with flatulence, but beyond that her condition is practically normal. She still continues to gain weight. The interest of the case lies first in the diagnosis, that instead of being a pyloric obstruction as had been supposed by other physicians, it turned out to be a typical hour-glass contraction of the stomach. The diagnosis chiefly depended on the absence of the marked dilatation of the stomach, which would occur in pyloric constriction and in the bubbling of the fluid through a narrow orifice, which was heard, not in the situation of the pylorus, but about the center of the stomach. The further point of interest is in the treatment. One was very much tempted to excise the contracted portion of the stomach altogether and stitch the walls together on each side and no doubt that would have been followed by complete recovery without any risk of recurrence of the contraction, for it must be admitted that there may possibly be an increased contraction still and some recurrence of the symptoms, but the patient was in an extremely feeble condition and it did not seem justifiable to subject her to the prolonged operation which would have been involved in this procedure.—London *Lancet*, March 19.

PRACTICAL NOTES.

Gastro-enterostomy for Non-cancerous Stenosis.—Hayem reserves this operation for a last resort after the failure of all medical measures, except in the case of the poor, for whom repose and proper diet are impossible. The hyperacidity will usually disappear if the opening into the stomach is made large enough. If bile flows back into the stomach it may irritate the glands

to a certain extent, so that the ideal operation prevents any retention of food in the stomach and any regurgitation of bile. —*Bull. de l'Acad. de Méd.*, April 5.

Condurango as an Analgesic in Gastric Pains.—The pain accompanying ulcer and cancer of the stomach, etc., can be quieted by administering five to eight pills a day containing ten centigrams each of condurango bark. It often prolongs the life of the patient by facilitating alimentation. Lemoine believes that the condurango, like coca leaves, contains some alkaloid or glucosid, which exerts an analgesic action upon the gastric mucous membrane. It has almost invariably relieved his patients during an experience of several years.—*Semaine Méd.*, May 18.

Bernay's Sponge as a Hemostatic.—At the last annual meeting of the American Laryngological Association, held in Brooklyn, N. Y., May 16, Dr. W. K. Simpson of New York demonstrated the use of the Bernay sponge, which he maintained would swell to fifteen times its size and absorb twelve times its weight of liquids. Its efficacy in general surgery he claimed to be due to the absorbing power, acting as a cleansing agent and then serving to pack the wound. This sponge consisted of cotton fiber subjected to many hundred pounds of pressure and compressed to a disc one sixtieth of an inch in thickness. It was especially adapted for use in the nares, was an excellent splint for the later stages of Asch's operation for deflected septum and could be used as a means of conveying medication to various parts of the nose.

The Hernias of Children.—Dr. W. B. Coley states that in upward of 300 operations for hernia in children under 14 years of age, he has had but one death, and that was from pneumonia. In seven operations in children under two years of age there was but one death, the patient being moribund at the time of operation. Bassini's method of operation is preferred. In four cases out of seven the cecum was found in the sac. Strangulation in infants is more common than is generally appreciated, and not infrequently arises from the bad advice to postpone wearing a truss until the age of one year. As to treatment, gentle taxis should be tried for one or two minutes; if this fails, applications of hot cloths should be made for them for from fifteen to twenty minutes, followed by taxis under chloroform, after all preparations for operation have been made. If this also is unsuccessful, immediate operation is to be undertaken. An attempt at radical cure can, in the great majority of cases, be made with safety.—*Archives of Pediatrics*, April.

Conservative Manipulation by Gynecologists Advised.—Dr. Howard Kelly has contributed to the *American Journal of Obstetrics* an article upon the needlessness of lacerating the hymen for the majority of gynecologic ailments. He speaks feelingly of the frequency with which the hymen is utterly disregarded, and attributes a much greater want of thought in this respect to female than to male practitioners. He urges that no one but an acknowledged expert should examine a virgin, basing his opinion upon the fact that delicacy of touch is needed to avoid lacerating the hymen, and upon the infrequency of any serious gynecologic lesion in this social condition. He then describes his method of examining virgins. He urges that while a skilled man can usually make a bimanual examination without lacerating the hymen, the latter is so frequently injured by the unskilled that most men should confine themselves to the use of the rectum in virgins, and that the patient should always be anesthetized and after anesthesia should be raised into the knee chest position and held there while air is admitted to the vagina and rectum. If she is then placed upon the back there should be no obstacle to the performance of a most satisfactory bimanual examination through the rectum. He describes a speculum which he has devised for use in the knee-chest position under anesthesia, in virgins. This speculum is closely similar to well-known Kelly vesical specul but is fitted with a beveled end in order to avoid the necessit of using an obturator.

Amyloform and Dextroform.—A new substitute for iodofor has recently been prepared by Professor Classen of Aix l Chapelle, which he names "amyloform," and which consis of a combination of formaldehyde with starch. It occurs as a almost impalpable white powder, devoid of all smell and ins uble in ordinary menstrua. In contact with the tissues of th living body, however, it breaks up, and when it was applied t extensive suppurating wounds formaldehyde could be detecte in the purulent discharge. At the same time the urine w proved to be quite free from it by distillation with dilute su phuric acid and the addition of fuming sulphurous acid, s that whatever formaldehyde enters the system must be full oxidized therein. However much amyloform is applied no toxi symptoms are produced, though a slight and transient smartin sensation is sometimes complained of locally. The clinica effect of the substance is very similar to that of iodoform, onl it is frequently more pronounced. In a number of cases of dee wounds with suppuration of bone from osteomyelitis or tube cle, a quantity of the powder very liberally applied caused th suppuration to cease in a very short time, in some instance where iodoform had previously been tried without much result In varicose ulcers of the leg and in the primary sore of syphili amyloform also proved useful. The above clinical observation were made by Bongartz in the Mariahilf Hospital, Aix-la-Cha pelle. It has been mentioned that amyloform is insoluble, bu a very similar substance has been prepared from dextrin instea of starch, which Classen calls "dextroform," and this is dis solved without much difficulty by both water and glycerin. It 5, 10, or even 20 per cent. solution has proved very useful, as in injection in gonorrhea, and the former of these solutions ha been employed with success for washing out the cavity of a empyema. Internally the solution has been prescribed with advantage in a case of cystitis.—*Lancet*.

Electric Light in Rheumatism and Neuralgia.—Kozlovski, i *Vrach*, has published an account of his treatment of rheuma tism and neuralgia by means of exposure to the electric arc He was induced to make these observations by the statement of Ewald, who is medical officer to some large iron works, tha he had noticed that since the introduction of the system o electric welding there had been a notable diminution in the number of cases of rheumatism, neuralgia, migraine and other nervous diseases among the workmen, which he attributed to the beneficial effect of the electric light. In order to bring this therapeutic agent within the reach of ordinary patients, Koz lovski has fitted up a consulting room with a suitable plant for producing the electric arc, which consists of a six-horse-power oil engine, a dynamo, thirty-five Tudor accumulators, a rheo stat, ampère-meter and electric arc lamp with reflector. With these he obtains an electromotive force of 50 to 60 volts and a current of from 250 to 300 ampères. The patient is placed at a distance of one and a half meters from the light and protected by blue spectacles and also by a screen of cardboard in which an aperture is cut to allow the light to fall on the affected region of the body. To this it is exposed for from three-quarters of a minute to two minutes. The patient feels a slight sensation of heat, though the temperature is never raised more than 4 degrees F., where the light falls on the skin, but nothing more until six or eight hours afterward, when itching and tingling are felt and the skin becomes reddened. Some forty-eight hours later, desquamation occurs, which lasts for two or three days. In the course of three months Kozlovski has treated thirty-eight patients, varying in age from 13 to 70 years, by the electric light. There were eight cases of sciatica, all of which recovered; four of neuritis (locality not stated), two of which recovered; eighteen of chronic rheumatism, fourteen of which recovered; three of lumbago, all of which recovered; three of occipital neuralgia, of which two recovered; and two of trigeminal neuralgia, one of which was greatly benefited. In most cases three or four sittings produced an amelioration of the pain. They were continued at intervals of three or four days, according to the amount of cutaneous irritation, but the total number of sitting never exceeded a dozen.

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SATURDAY, JULY 2, 1898.

BUBONIC PLAGUE IN BOMBAY.

The plague has always been an interesting field for the litterateur as well as the scientist. The animated description of DE FOE, the child-like simplicity of PEPYS, have made accounts of the ravages of the frightful plague entertaining, and so far as science is concerned it is only necessary to look at the vast number of titles in the Index Catalogues of the Surgeon-General's office to see how much has been written on the subject of the plague. Many of the interesting points in the story we are in the habit of relegating to the past, and to think of these as having occurred at some time during the back ages, but by a report printed in our day we are brought face to face with the same conditions, the same panics, the same disturbances as those which characterized the plague days of the fifteenth and seventeenth centuries.

KHAN BAHADUR DOCTOR CHOSKY, in his report on the Bubonic Plague at Arthur Road's Hospital, Bombay, says: "The first plague patient was admitted on the 24th of September, 1896, and two more following before the end of the month. In the month of October there were 85 admitted, which gradually increased until there were 182 admitted in December, 277 in January and 365 in February. This taxed the hospital to its utmost capacity, as naturally enough with the increase of inmates there must be a comparative increase in the servants and assistants."

Dr. CHOSKY further says:

"Every effort was therefore made to secure additional servants, but in spite of the continuous efforts of the authorities to procure them even on double or treble pay, the greatest difficulty was experienced. There was extreme reluctance on the part of men, who had never been in their lives inside a hospital, to take service, especially in a plague hospital, and when asked, they openly said that they would not endanger their lives under any consideration; some, however, were induced to join but only worked for a few hours or days and then ran away, never even coming to claim their wages. The number and the frequency of deaths, combined with the delirious condition of patients, used to frighten them, and indeed the sights and sounds of a plague ward in the dead of night, with the groans and moanings of the delirious patients, were enough to appal the stoutest heart. Old servants could with difficulty be induced to remain, and a majority of them on that account went on strike and refused to work. All of them were given a bonus to make them continue in service, and their pay all round had to be increased. They were asked to induce some of their own friends to take up work in the hospital, but to no purpose. They used to come, work for a short time and run away as before. Pay however large was no inducement. They had never seen so many people dying as they did in the plague, for the largest number died at the Arthur Road Hospital, both because of the numerous admissions and because so many cases were brought in a moribund condition. It was not until March, when the epidemic commenced to decline, that a considerable number could be induced to join, and strange to say among the latter were some people who had attended their sick friends in the Hospital."

There were three Hospital Assistants who worked practically night and day, Dr. CHOSKY himself putting in from six to seven hours' work every day.

"Apart from these difficulties," says the Doctor, "the Hospital had to contend against the ignorance and prejudice of the people, always averse to going to a hospital, and more so when sent there against their will and under compulsion. Time after time patients in a moribund condition were brought to the Hospital, to whom no relief could be given, as they were practically past all help and they came simply to die, the Hospital getting all the popular discredit attached to the heavy mortality. Nearly one-third of the total admissions during the six months died within twenty-four hours of admission, by far the greater number dying within a few hours and some even within a few minutes. At times patients were found dead when brought to the Hospital in ambulances, and the corpses were sent direct to the burning grounds. Added to this heavy mortality, the means used to resuscitate and support their strength, especially subcutaneous injections, were misconstrued, and it was openly said that the doctors were killing the patients in order to stop the further ravages of the epidemic. It was also freely stated that the patients were purposely killed and their hearts taken out in order to send them to Her Majesty, the Queen-Empress, to appease her wrath on account of the disfigurement of her statue, which occurred in the beginning of the epidemic. All this culminated in a raid on the Hospital in the forenoon of 29th of October, 1896, when a large number of mill-hands, estimated from 800 to 1000, rushed toward the Hospital, breaking open the gates and scaling the walls with a view to wreak their vengeance on the Hospital staff for the alleged killing of patients. Road metal was freely thrown at the Hospital staff, some of which reaching the wards, broke the tiles and injured some patients, but fortunately no one was seriously hurt; on learning that the police were approaching, the men dispersed in all directions. An armed police guard had to be quartered on the premises for a long period and Arthur Road, which is one of the main roads leading to the mills, was patrolled by mounted and foot police for a considerable time after the raid. The Hospital assistants were openly threatened with violence; they dared not go out of the compound for their meals, etc., unless shadowed by policemen in plain clothes, and it was under such conditions

that the work of the Hospital was conducted for some two months."

The usual crop of charlatans seemed to develop, following in the wake of the victims of the plague like vultures after a battle. The report says:

"The plague epidemic had suddenly created in our midst a host of pseudo-specialists who pretended to know all about the plague and who for a time, forgetting their usual avocations of tramway conductors, railway guards, engineers, postal inspectors, clerks, etc., suddenly blossomed forth into plague specialists, vaunting their nostrums day after day, and pestering the health officers as well as the medical officer of the hospital. Then again, the permanent quacks had their specialties, and in some cases even duly qualified medical men, who ought certainly to have known better, came out with strings of prescriptions and specifics with the view of obtaining a fleeting notoriety."

Being in India instead of America, we suppose the Doctor was spared the spectacle of seeing photographs of these people staring at him from every edition of the daily newspapers.

Of the hospital staff the assistant medical officer, Dr. P. N. DAVDA, and three ward boys were attacked with the plague. Dr. DAVDA unfortunately died, notwithstanding the naïve remark in the report (page 45), in speaking of preventive treatment: "None of the hospital staff were inoculated with Professor HAFFKINE'S preventive serum. The late Dr. DAVDA had, however, 10 c.c. of Dr. YERSIN'S serum injected as a preventive about three weeks previous to his illness."

Preventive treatment in the hospital was directed toward lessening the risk of infection among the hospital staff and ward attendants who came in contact with the sick. Free ventilation, frequent disinfection of the hands, frequent changes of clothing were required. Floors were sprinkled with chemic disinfectants. The clothing and other belongings of the patients were destroyed by fire, and it may be assumed that this treatment was successful, inasmuch as but three of the attendants had the disease. As to the different methods of treatment, the author is of the opinion there is no specific treatment.

In regard to postmortem appearances, the author says: "If it were possible to convey in one word the principal postmortem signs of the changes that are found in the system, that word would be hemorrhage. Hemorrhages in every conceivable and inconceivable part of the body."

Our space is too limited to quote more from this very interesting report, a report which deals with the total number of cases, 939 in the short space of five months, a report so evidently written from a full knowledge of the disease that it will be turned to for many years to come as an authoritative treatise on the plague; therefore in sharp contrast with the emanations from the public press on this subject purporting to come from a certain official sanitary bureau, photograph of the incumbent duly attached.

INHERITANCE OF CIRCUMCISION EFFECTS.

No question in biology has been discussed with more animation than that of the transmission by heredity of acquired defects. Prominent among those who denied hereditary transmission of acquired effects was WEISMANN. His writings have been received with much favor and he has won a very numerous following. The effects produced by his criticisms have been undoubtedly beneficial in removing from certain ideas of heredity their crudeness. The older notions of heredity were much more vague and at the same time more sweeping than those held by modern biologists. WEISMANN'S followers have cleared up much obscurity, but at the same time by too intense devotion to a theory have added even more. WEISMANN for example rides the germ hobby to death, in his attempt to explain the transmission by heredity of traumatic epilepsy in guinea pigs. He assumes that epilepsy is always of microbic origin. The reason therefore that the mother most transmits epilepsy is because the ovum being larger than the spermatozoon it necessarily carries more microbes of epilepsy than the latter. As his explanation fails to demonstrate that epilepsy is of microbic origin, it utterly fails not merely to exclude all other hypotheses but even to explain the facts themselves. This is a fair illustration of the weakness of WEISMANN'S position in regard to the transmission of acquired defect.

Indeed such evident transmission has forced him to a concealed though rather complete reversal of his absolute position on the subject. In his latest work ("The Germ-Plasm," p. 535) he admits that nutrition of the germ-plasm will modify heredity. As nutrition of the germ-plasm depends, according to WEISMANN on the state of nutrition of the spermatozoon and the ovum it is obvious that this must depend on the state of nutrition of the male and female producing these. It is therefore evident that the state of mental and physical health of the parents will modify the offspring despite the tendencies to continuity of the germ-plasm on which such stress has been laid by WEISMANN. One of the "facts" on which the strongest stress has been laid by WEISMANN and his followers as an argument against hereditary transmission of defects, is that of circumcision. WEISMANN admits it is certainly true that among nations which practice circumcision as a rite ("Heredity," Chap. 8), children are sometimes born with a rudimentary prepuce. This however, according to WEISMANN, does not occur more frequently than in other nations where circumcision is not practiced as a rite. The truth of this last assertion is seemingly supported by instances recently appearing in the literature. P. C. REMONDINO of Los Angeles, California, has seen a large number of cases ("Circumcision") of prepuce absence in Hebrews which prove to be hereditary. After one confinement in a Gentile his attention was

called to the child by the nurse. She thought it was deformed because of the size and appearance of the glans penis. On examination the prepuce was found to be completely absent. On inquiry the father, and another son born more than two decades previously (these comprising every male member of the family), were found to have been born with the glans fully exposed. REMONDINO has seen a French family in which there was similar heredity.

The statements about the non-transmission by heredity of circumcision effects have been so strongly reiterated that it is hardly astonishing that they were long accepted and the non-inheritance referred to the healthy atavism of the maternal side. Of late these assertions of WEISMANN and others as to circumcision non-inheritance have been questioned. Dr. WILLIAM WOLFE of Baltimore some years ago (*American Medico-Surgical Bulletin*, 1895) reported as the results of long research that two per cent. of the Hebrews coming under his observation were born without a prepuce, and that a much larger proportion had defective ones. Stimulated by his researches Dr. EUGENE S. TALBOT of Chicago was led (*Medicine*, June 1898) to institute an inquiry as to the conditions of the prepuce found by the Hebrew clergymen of Chicago engaged in performing the religious rite of circumcision. He found that the percentage obtained by Dr. WOLFE was not as great as that occurring in Chicago. He obtained results from the Rev. Drs. S. BAUER, M. A. COHEN and B. GORDON. Dr. BAUER had circumcised 3400 and found that the prepuce was absent in 3½ per cent. of the cases. Dr. COHEN had circumcised 10,000 times. He had found the prepuce absent in 500 cases; partially developed in 300 cases and slightly developed in 2000 cases. Dr. GORDON had performed 4400 circumcisions in 25 years. He had found the prepuce absent in 150 cases; partly wanting in 200 and slightly developed in 2200. These, it should be remembered, were cases where preputial deformity casually forced itself on observers who were not pursuing special investigations as to the inheritance of the results of circumcision.

Considering the emphasis with which the non-inheritance of the preputial effects of circumcision has been reiterated, the most astonishing result of Dr. TALBOT's researches was the discovery that rabbinical literature contained disputes on the subject of the religious treatment of cases where the child had been born circumcised. There was very early a difference of opinion on this subject between the schools of Shammai and Hillel. The school of Shammai maintained that if a child be born circumcised it is still necessary to draw from him the dram of covenant blood; the school of Hillel maintained that this was not necessary. According to another authority this point was not involved in the discussion since both schools were of the opinion that where a child had been born circumcised the drop of the blood of the covenant had still to be drawn from him on the eighth day. The dispute related however to an adult proselyte who happened to have been born circumcised. In this case the school of Shammai insists upon the ritual drawing of blood. The school of Hillel claims that ritualistic drawing of blood was in such case unnecessary.

In the Medrash (the homiletic commentary of the Rabbis on the Old Testament) nearly every prominent man mentioned in the Bible as well as some of the later prominent rabbis, are stated to have been born circumcised. Among these were MOSES, SAMUEL, ISAIAH and Rabbi AKIBAH. The law relative to children born circumcised was codified 1567 A.D., in the Schulchan Aruch. Joreh Deah, Hilctroch Milah, Beth Shammai and Beth Hillel quoted in it flourished between 70 B.C. and 70 A.D. These results of Dr. TALBOT render it clear that not only does circumcision produce inherited defects more frequently among the Hebrew than among other races which do not practice circumcision but that this has occurred to such an extent that the treatment of such cases has long been recognized as a subject for discussion in the religious literature of the Hebrews.

REGIMENTAL HOSPITALS IN FIELD SERVICE.

As a people we are learning by experience that it takes time to turn out a volunteer army of 125,000 men fully armed and equipped. Early in April, when the war cloud was gathering, we read in our newspapers about the active work of preparation going on in the armories, and how this and the other regiment was ready to take the field at an hour's notice. In fact, we were led to believe that when the call to arms should sound the quota of each State would be ready to fall in. And grave doubts arose in our mind as to whether, in the short time that would be needful to form the regiments into brigades and divisions for purposes of field command, the medical department would be able to put itself on a fighting basis with field hospitals and ambulance companies properly manned and efficiently equipped. We were aware that however well drilled a company or regiment of citizen soldiers may be, some little time in a camp of instruction is needful before they can form an efficient part of an army. Besides purely military drills, the men have to learn how to live in canvas shelters carried by themselves, and even how to cook for themselves when the wagons can not come up with the mess-chests and camp-kettles; and the officers have to learn how to utilize the army ration that their men may have as full and varied a diet as may be found in the company messes of our regular troops. But we doubted whether the time required for these purposes would suffice to enable our military brethren to get ready their system of organized relief for the sick and wounded of a large army.

However, the mustering in of the men, associated

as it was with a strict medical examination, took much longer than was anticipated: and when mustered in and transported to war camps at Chickamauga and Washington, and even nearer their possible battle-fields, as at Tampa, Fla., it was found that there was still much to be done that must consume time before the regiments could be considered fit to undertake the field duties of soldiers. Meanwhile the Medical Department has been utilizing the time to the best advantage. The hospital corps has been recruited by enlistments and transfers from the line, medical and hospital supplies have been provided, ambulance wagons have been built and distributed and the organization for field service has been progressing on the lines outlined by us in the JOURNAL of May 21. Lieut.-Colonel B. F. POPE, U. S. Vols. (Major and Surgeon U. S. A.), chief surgeon of the Fifth Corps, at present before Santiago de Cuba, has perfected his organization and is ready to meet any of the emergencies of military life in time of war. The troops of this corps are mostly regulars and their medical officers are accustomed to obey orders, so that Chief Surgeon POPE has found it an easy matter to perfect his organization.

It is not so, however, with Lieut.-Colonel A. C. GIRARD (Major U. S. Army), chief surgeon of the Second Army Corps at Camp Alger, Falls Church, Va. In our recent discussion of the subject of organization we showed that the regiment is too small a unit on which to build a satisfactory medical service for the care of the wounded of a great battle. The regimental hospital is an excellent institution when a regiment of the National Guard goes into camp for a ten days' summer picnic, or even when called out for duty as a State public force; but it is valueless when an army corps of twenty-seven regiments is drawn up in line of battle. Wherefore, when the new regiments arrived at the camps of organization and instruction, the duty of the chief surgeon was to prepare the medical department of the corps for field service by breaking up the regimental hospitals and organizing the medical relief by divisions. The Second Army Corps consists wholly of volunteers, and certain of the regimental medical officers have taken exception to Dr. GIRARD'S efforts to prepare them for war service. They object to having their hospitals broken up and their regimental medical service turned into a mere dispensary service, although the seriously sick receive the best medical attention which the division can provide. Yet some of the volunteer colonels have espoused the cause of their medical officers and protested to the War Department against the change of method. This action of local commanders has so emboldened one of the medical officers that, according to newspaper accounts, he has declared that his hospital shall not be broken up until the whole military strength of his State has been overpowered.

It is to be regretted that medical men who have voluntarily offered their services to aid the Medical Department of the Army in caring for the sick and wounded of the war, should be the obstacle to a proper organization by their failure to recognize any conditions in the present different from those of the summer picnic; but fortunately this difficulty in the Second Army Corps appears to be an isolated experience, for we have heard of no trouble in the organization of the medical departments of the other corps of the Army.

CACHEXIA OF MALIGNANT TUMORS.

The condition of emaciation, anemia and general prostration which accompanies many of the malignant tumors was formerly believed to be a specific symptom of the disease and was called cachexia. Even earlier, the condition, under the general name of a dyscrasia or diathesis, was supposed to precede and induce the growth of malignant tumors. At the present day as well, cachexia is considered by many to be one of the essential symptoms of a malignant growth, yet this opinion must be much modified in the light of observations made upon any given series of patients suffering from malignant tumors.

Cachexia is a term also used to express the condition of patients suffering from a variety of chronic general diseases, such as insufficient food, chronic septicemia or intoxication, leukemia, Addison's disease and anemia. In these diseases there is a general disturbance of metabolism which is chronic in its course and unassociated with temperature. There is an excessive waste of proteids and fats in all of the organs of the body with a resulting condition of malnutrition and weakness: fat disappears from the body; the blood is altered in its composition to produce a pale, anemic appearance to the skin; edema may be present; the patient is feeble and emaciated and the prostration may become extreme. These symptoms are the same that are assigned to the cachexia of malignant tumors, and, in a study of those malignant cases in which cachexia is present, it will uniformly be found that there is, either some interference with the proper nutrition of the patient by reason of the location of the tumor, or there is an absorption of deleterious materials, a chronic intoxication from ulceration, sloughing or degeneration in the tumor.

The most typical examples of cachexia, it will be remembered, are seen in cases of carcinoma of the stomach, esophagus and intestine, where the assimilation of food may be almost entirely prevented. As has been previously stated, insufficient food alone may produce a condition of cachexia, and it is easy to understand how a carcinoma of the esophagus or pylorus, no larger than a walnut, may produce a total obstruction. In carcinoma of the body of the stomach a similar malnutrition is present, because very little nitrogenous food can be digested in the absence of

free hydrochloric acid and rennet. A fact in favor of such dependence of the nutrition upon diet is found in the marked decrease of the cachexia after a gastrostomy has been performed for carcinoma of the esophagus.

Secondly, those cases of cauliflower carcinoma of the cervix, ulcerating carcinoma of the breast and huge sloughing sarcomata, form another class giving prompt and decided cachexia. In such cases it is a plain surgical question of septic intoxication by the toxalbumins of the bacteria of decomposition, which are developing in the necrotic tissue, and it is a fact that, when such a mass is freely curetted away and the field maintained aseptic, as is possible in the inoperable cauliflower carcinomata of the cervix, the symptoms of cachexia disappear. Furthermore, from such ulcerating surfaces there is a continuous discharge and this escape of albuminous material from the body must act injuriously on the system.

The pain accompanying many forms of malignant tumors often deprives the patient of his sleep, and the mental worry together with the universal horror of cancer must contribute much toward the failing nutrition. The demands made by the rapid growth of such tumors upon the nutritive supply of the body can not have a very great influence upon the general body nutrition, because the drain made by the simple growth is not, under ordinary circumstances, very considerable. It must be remembered that, clinically, the most malignant of tumors do not, as a rule, give rise to cachexia, unless they have undergone degenerative change or are so situated as to prevent food assimilation. Patients the subject of operation for a third extensive recurrence, or in the presence of tumors of long standing, usually have no cachexia when such conditions of degeneration or obstruction are not present.

Whether the tumor itself manufactures substances which are poisonous to the body in general is unknown. RINDFLEISCH assumes that the normal epithelial cells aid in the elimination of certain chemic substances from the system. When, however, these cells are enclosed in spaces in the interior of the tissues, as in cancer, the substances can not be thrown off, and at the same time the products of the degenerative processes that are going on in the growth are carried into the circulation, and they exert a poisonous influence upon the blood.

THE IMPORTANCE OF CLOTHING IN WAR.

Medical men on reading the heading of this article would naturally think that we purposed referring to texture, porosity, conductivity, and with Cuba and the Philippines constantly in mind, to the importance of protection from chill; but clothing is important from another point of view as was brought to our notice by a column in the *Daily Mail* of May 11, 1898, on "Why British Officers in India are so Often Killed." Captain NORTON, M.P., holds that as these officers wear a different head-dress from that of the native officers and troops under them, they are rendered especially distinguishable to the enemy's marksmen. This danger in modern warfare has long been recognized in Europe; but in native regiments in India where all but the English officers wear an Eastern head-dress while the pith helmets of the latter are a fatal distinction. It is gratifying to know that the needful protection has been given to our Volunteer officers on field service. General Orders No. 39, of May 9, 1898, from the Headquarters of the Army, prescribe a light brown blouse of cotton drilling or khakie, with trousers of the same color, for all commissioned officers from the major-general commanding down. As the campaign hat is similar to that worn by the enlisted men, and the insignia of rank require close inspection for their detection on the collar and flat strap on the shoulder, the officer, from the point of view of the enemy's marksmen, is indistinguishable from his men. This will have an important bearing on the make-up of the nominal killed and wounded when such have to be rendered by the medical officers of our Army.

THE ROENTGEN RAY IN WAR SURGERY.

The English papers of May 21 give considerable space to a lecture delivered on the previous day before the Royal United Service Institution by Surgeon-Major BEEVOR of the army medical staff. The object of the lecturer was to give his experience in the working of the X-ray in military surgery, and to show by the results obtained in the recent frontier expedition in India that the apparatus can be carried on a campaign and be of the greatest possible benefit to the wounded. He maintained, in view of his success, that it was the duty of every civilized nation to supply its wounded in war with an X-ray apparatus, among other surgical aids, not only at base hospitals but close at hand wherever there might be fighting. There is no doubt of the desirability of having this aid in field hospitals nor of the possibility of furnishing it for the field hospital of a particular expeditionary force, but we doubt the ability of any army medical department, with our present experience af the X-ray, to have it available in the field hospitals of a large army during the hours of activity that follow the incoming of the wounded from a great battle. Surgeon-General STERNBERG has provided the apparatus for the Philippine expedition, for the hospital ship *Relief* and for the general hospitals to which the wounded from the field hospitals will be sent for treatment; and the experience thus gained in its applicability to war surgery may lead hereafter to a further extension of its use on behalf of the wounded in war.

CORRESPONDENCE.

WAR CORRESPONDENCE.

BY LIEUT.-COL. NICHOLAS SENN, U.S. VOLS.,
CHIEF SURGEON SIXTH ARMY CORPS.

CHICKAMAUGA, GA., June 22, 1898.
CAMP GEORGE H. THOMAS.

From early dawn until taps, Camp Thomas is the scene of a busy, active life. It is the gathering point of the largest army concentrated in one place since the War of the Rebellion. It is at the present time the temporary home of 45,000 men representing almost every State in the Union. Many of the regiments are short of their quota, and recruits to the number of 500 on an average arrive daily to complete the organization of the regiments now in camp. The commander of the whole army in camp is Major General John R. Brooke, General in Chief in charge of the Department of the Lakes. He came here from Chicago with his entire staff. He enjoys the reputation of being a strict disciplinarian who does everything through the legitimate military channels. The greatest sources of confusion and consternation to the officers of the volunteers from civil life are these mysterious military channels which extend from the General's tent to the heads of the many departments in Washington. One of the blue books in constant use by officers, high and low, young and old, is the U. S. Army Regulations, 1895. The thousands of questions asked the professional soldier daily by his less informed volunteer officer are answered more often than otherwise by "Study the Regulations, *Study the Regulations*, STUDY THE REGULATIONS." Such advice, as a rule, is more easy to give than to follow with any expectation of approval at headquarters. The experience here has satisfied me more than ever that the National Guard officers need more thorough training in executive, clerical work, so essential in the efficient management of troops at home and in the field. One of the common sights in camp is to see an officer hide himself away under a solitary tree and pore over a work on tactics or the much feared "Regulations." If this war does nothing else but demonstrate to our people and to the legislators, State and National, the necessity of a well organized militia it will have accomplished a great deal. If we had in this country, as we ought to have, a well organized, well equipped militia force of 200,000 men, we would have been in possession of all the Spanish islands and Spain itself, if we wanted it, long ago. As it is, it takes two millions a day and the hardest kind of work to bring our volunteers into fighting trim. The officers of the regular army have reason to be thankful to Spain for having given them a chance to fight. They have been looking a long time anxiously for such an opportunity. They are the recognized salt of the army. The Government has fully recognized their claims. Nearly every day the newspapers bring columns of names of lucky officers who have been advanced in rank, in fact it seems almost impossible for any one of them to escape promotion of some kind. This is probably as it should be, but occasionally such promotions lead to giddy heights. To make a lieutenant-colonel out of a second lieutenant of very limited practical experience is a transition of doubtful propriety and often followed by the most detrimental results, both to the over-ambitious officer and the over-confiding troops placed under his charge. Officers thus honored by promotion and assigned to the army of volunteers are, as a rule, more anxious to change the shoulder straps than to add the V. to the U. S. on the collar of the blouse. On the whole, the regular army officers are perfect gentlemen and great favorites in the camp, and the feeling between them and the officers from civil life is of a most cordial nature.

The First Army Corps under General Brooke is nearly completed. The Third Army Corps under command of Major-General Wade is nearing completion. The Sixth Army Corps is soon to be organized under Major-General James H. Wilson. General Wilson gained an enviable reputation during the late war as a dashing cavalry officer and will undoubtedly make a creditable record during the present war if it lasts long enough to bring his army into the field. Lieut.-Colonel Hartsuff, an experienced medical officer of the regular army, is Surgeon-in-Chief of the army gathered here, and as such is attached to the staff of General Brooke. Lieut.-Colonel Van Hoff is Chief Surgeon of the Third Army Corps, and has worked incessantly in completing the organization of the medical department under his supervision. He is regarded as one of the ablest executive officers of the medical service, and is known as a warm friend of the medical officers of the National Guard. He has from the very beginning taken a deep and active interest in the work of the Association of Military Surgeons of the United States. Every medical officer of the Third Army Corps should consider it a great privilege to serve under Lieut.-Colonel Van Hoff. The medical department of the First Army Corps is in charge of Lieut.-Colonel Heidekoper of New York, a hard-working, conscientious officer. Major Kimball of Marion, Ind., and Major Woodbury of New York, have reported here and are awaiting with the writer the formation of the Sixth Army Corps. At present my time is profitably occupied by consultations in the camp and by performing operations in the Leiter General Hospital and the St. Vincent's Hospital, Chattanooga. The evenings are occupied by giving lectures on first aid to the Hospital corps. St. Vincent's Hospital has been used as a temporary hospital for the troops until the Leiter Hospital was in condition to receive patients. The abandonment of regimental hospitals meets with the same opposition here as elsewhere, but the wisdom of such a course must be apparent to all who have had experience in the field. Major E. C. Carter, U. S. A., is now in charge of the Leiter General Hospital. He is one of the busiest men in the camp. He is in every way admirably adapted for the position he now occupies. He is straining every nerve to improve and equip the building for the accommodation of from 300 to 500 patients. He has the hearty co-operation of the Surgeon-General and Colonel Hartsuff

Major-General John R. Brooke.
General in Chief in charge of the Department of the Lakes.

in pushing the work. About thirty patients are at present in the hospital and in less than two weeks the number of patients will exceed one hundred. Hospital furniture and supplies are arriving every day, and in the course of two weeks the hospital will be fully equipped. The value of this hospital to our sick soldiers can not be overestimated. Mrs. Leiter will have the respect and sincere gratitude of every one of the inmates and of hundreds yet to come. Chickamauga is a quiet little country hamlet where our patients can enjoy to the fullest extent what they are so much in need of, rest and quietude. Six trained nurses have been sent by the Surgeon-General and are now on duty. With the increase in the humber of patients more will be sent. A corner room in the tower on the second story has been set aside as an operating room and is now undergoing the necessary repairs to adapt it for this purpose. The first operation performed in this hospital was for empyema following pneumonia. Two additional cases await a similar operation during the course of the week.

Major-General James H. Wilson.

CRAWFISH SPRINGS.

One of the great attractions near the National Park and adjacent to the Leiter General Hospital is the famous Crawfish Springs. At the end of a large basin and at the base of a rock a large volume of water, as clear as a crystal, is poured out with considerable force. This spring yields 62,000,000 gallons of water in twenty-four hours. The temperature of the water is 56 degrees F., summer and winter alike. The dam a little below the springs, utilized to furnish water power for the hotel, has been removed for the reason that it interfered with the supply of water, deviating it evidently through subterranean channels in another direction. As soon as the property was transferred to Mrs. Leiter for Government use I had the basin cleaned out of moss and dirt by a detail of soldiers furnished by the Fifth Illinois Infantry. The sides of the hill around the basin were ditched a few feet above the level of the water for the purpose of draining the surface water to a safe distance below the springs. The Hospital is supplied with water from this spring. Besides, hundreds of barrels of water are brought daily into the camp by mule teams. The water is wholesome and palatable.

The following is the result of a chemical analysis made by a competent chemist:

ANALYSIS OF CRAWFISH SPRINGS WATER.

Bicarbonate of lime	0.6753
Bicarbonate of magnesia	0.4544
Sodium chlorid	0.856
Potassium chlorid	0.048
Silica	0.0537
Free ammonia	0.0029
Albuminoid ammonia	0.0025
Oxygen absorbed	0.031

The presence of free ammonia and albuminoid of ammonia, although small in quantity, led us to suspicion the presence of organic matter which might possibly prove to be a source of danger. For the purpose of testing the water still further as to its fitness for hospital and camp use, samples were sent at three different times to the professor of chemistry in the Chattanooga Medical College. Dr. H. Berlin made a very careful chemic analysis and bacteriologic examination with the result that he pronounced the water free from dangerous organic matter and pathogenic microbes. The only microbe which he was able to cultivate was the colon bacillus, and the presence of this microbe could be readily accounted for by the blocking of the sewer pipe, an evil which was promptly removed. The springs would furnish an ample water-supply for the whole army if the Government would only erect a pumping station near it, a project which is now under serious consideration. With such an improvement Camp George H. Thomas would be one of the most salubrious camping places in the United States for a large army. The intake now is some distance below the springs where the flow of water is impeded by a dam two miles and a half below the springs. Above the dam is a narrow beautiful lake two miles and a half in length, extending to near the springs, which is leased by the Chickamauga Fishing Club.

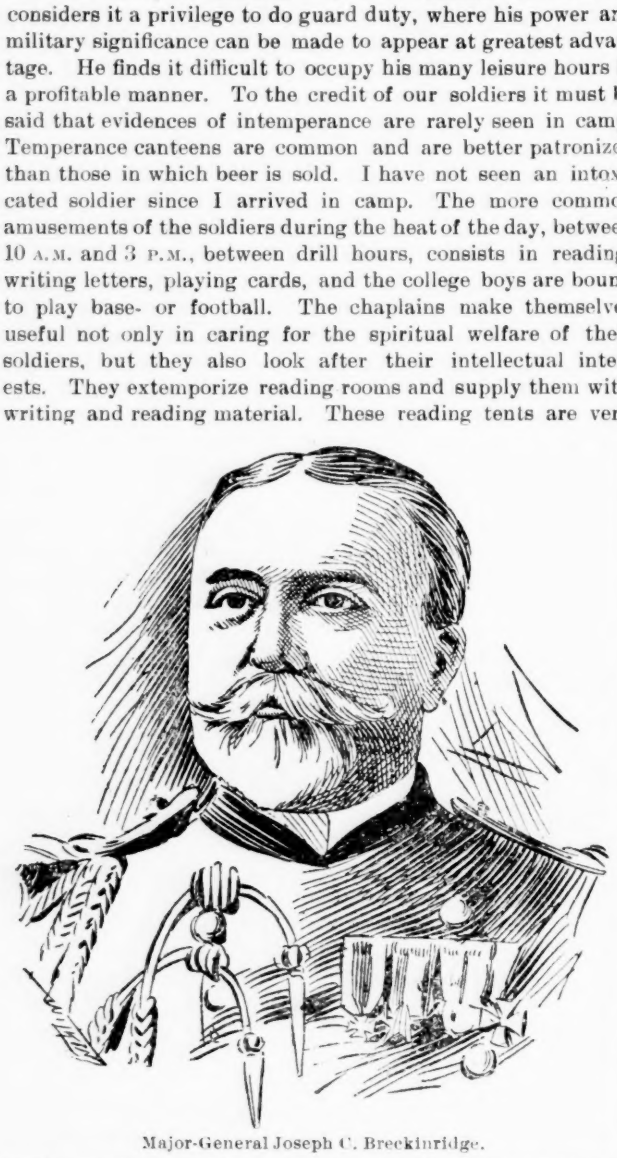
CHATTANOOGA MEDICAL SOCIETY.

This medical society meets twice every month, on the first and third Friday. At the last meeting the subject selected by the committee was "The Modern Treatment of Gunshot Wounds in Military Practice." The writer was invited to open the discussion. After a brief résumé of the character of wounds inflicted by the modern bullet, the treatment was considered in detail. Special stress was placed upon the inutility of the ordinary and Nélaton's probe in locating and finding bullets lodged in the body. Attention was called to the value of the X ray as a substitute for the probe in making a reliable diagnosis. The use of the bullet probe on the battlefield was condemned and the advice given that bullet wounds should be hermetically sealed with the first aid package, which should contain an antiseptic powder composed of boracic acid and salicylic acid (4:1), and no exploration made until the patient reaches the field hospital, where all facilities for aseptic surgery and the necessary instruments for diagnosis and operation should be at hand. A new bullet probe and bullet forceps devised by the writer were exhibited and their manner of use explained. The balance of the paper treated of gunshot wounds of the extremities, cranium, chest and abdomen. For want of time consideration of the last subject, "Gunshot Wounds of the Abdomen," was postponed until the next meeting. Invitations to attend the meeting were sent to the military surgeons in camp, consequently the attendance was large and the discussion became general and proved of interest to all present. Considering that Chattanooga has only 40,000 inhabitants and that the average attendance at these meetings on ordinary occasions is never less than from thirty-five to forty, is the surest indications that our colleagues in this city take an active interest in the scientific work of the profession.

AMUSEMENTS.

The civilian soldier finds it difficult to satisfy his mind and body with what is required of him in camp life. But a few weeks ago he was a professional man, a clerk, teacher, or left

the school, workshop and plow, and now it is hard for him to imagine that he should not be kept busy from sunrise to sunset. He is only too anxious to drill in sunshine or rain, and considers it a privilege to do guard duty, where his power and military significance can be made to appear at greatest advantage. He finds it difficult to occupy his many leisure hours in a profitable manner. To the credit of our soldiers it must be said that evidences of intemperance are rarely seen in camp. Temperance canteens are common and are better patronized than those in which beer is sold. I have not seen an intoxicated soldier since I arrived in camp. The more common amusements of the soldiers during the heat of the day, between 10 A.M. and 3 P.M., between drill hours, consists in reading, writing letters, playing cards, and the college boys are bound to play base- or football. The chaplains make themselves useful not only in caring for the spiritual welfare of their soldiers, but they also look after their intellectual interests. They extemporize reading rooms and supply them with writing and reading material. These reading tents are very



Major-General Joseph C. Breckinridge.

popular, and when the men are off duty they are always crowded. The many regimental bands furnish excellent music, which does so much in cheering up and amusing the soldiers. Two theaters have sprung up in the camp, mushroom-like. Performances are given in the afternoon and evening. The admission fee is twenty-five cents, box seats fifty cents. I have been told by those who have been in the habit of attending that the plays are good and that the patrons are made to feel that they have received their money's worth.

RED CROSS ASSOCIATION.

The Medical Department during the present war is in a condition fairly well prepared to supply the sick and wounded with the necessary instruments, medicines and food. There will be only a very limited field of usefulness for the Red Cross Association to fill in defects here and there as occasion and circumstances may require. The work of the Red Cross Association is, however, recognized by the War Department, as becomes evident from a circular letter received a few days ago from the Surgeon-General:

SURGEON-GENERAL'S OFFICE, WASHINGTON, June 9, 1898.

Lieutenant-Colonel Nicholas Senn, Chief Surgeon, U. S. Volunteers, Sixth Army Corps, Chickamauga Park, Ga.

Sir:—The Secretary of War has approved the following proposition made by the American National Red Cross Association, and the chief surgeons of Army corps and divisions will co-operate with the authorized agents of this Association for the purposes indicated:

"We can put any desired amount of hospital supplies—ice, malted milk, condensed milk, Mellin's food, etc., into any of the volunteer camps in a few hours. Will you be kind enough to bring this letter to the attention of Secretary Alger and ask him if there is any objection to our appointing a Red Cross representative to report to the commanding officer and the chief surgeon in every camp, confer with them as to their immediate needs and, if anything of any kind is wanting, open there a Red Cross station and send in the supplies. We can do this, not in a few weeks or a few days, but in a few hours, and can furnish any quantity of any desired luxury or delicacy for hospital use. We hereby tender our aid and put our organization at the War Department's service for co-operation in the field." Very respectfully,

GEO. M. STERNBERG, Surgeon-General U. S. A.

It was prudent and wise that the Surgeon-General and the Secretary of War granted this modest request. Dr. Gill of New York represents the Red Cross Association here. He arrived a few days ago and intends to erect a frame building near the general headquarters as a storehouse for the supplies. He possesses excellent executive abilities combined with modesty, which will ensure him a wide avenue of usefulness and the hearty appreciation of the medical officers. In my next communication I will speak of the hospital corps, its organization and scope of work in actual warfare.

Belladonna Poisoning Simulating Puerperal Insanity.

NEW YORK CITY, June 25, 1898.

Mrs. G., 26 years old, was delivered last January of an anacephelous male child. Labor was short and natural. Two days after, to prevent the secretion of milk with the consequent painful distention of the breasts, a belladonna plaster was applied to each gland in addition to the usual bandage compression. The nipples were not covered by the plasters. In about twelve hours I was hurriedly called to my patient and found her condition as follows: Flushed face, pulse 100 and good; temperature 100.5 degrees and quite actively delirious. She sang, whistled, laughed, cried and made futile attempts to get out of bed and house. Finding no appreciable cause for the combined disturbance of body and mind, puerperal insanity suggested itself as the most probable diagnosis.

The second visit was made sixteen hours after the first; the woman's condition was found to be much worse, namely: Her delirium was intensely maniacal in spite of the fact that she received large and frequent doses of chloral and bromid. However, at this visit new features were added to the old clinical picture which at once removed the diagnosis of insanity and established one of belladonna poisoning. The patient's lips, tongue, mouth and throat were dry, the pupils fully dilated and the secretion, as urine, was almost totally suppressed.

The belladonna plasters were quickly removed and the breasts washed with soap and water. The breasts were examined for a scratch or an abrasion which could serve as an avenue for absorption, but as none was found the drug evidently found its way into the system through the unbroken skin.

All the symptoms disappeared within ten hours of the removal of the cause excepting the pupillary dilatation, which lasted thirty-six hours.

It may be interesting to add that the very same condition was produced in the same patient four days later by the application of one plaster only and the removal of which resulted in the removal of the trouble.

The points of interest in this report appear to be these: 1. The remarkable susceptibility of this woman to the influence of belladonna. 2. The minimum amount of the drug which produced the symptoms of poisoning. 3. The possibility of mistaking that condition for acute insanity when it occurred in

the puerperium. 4. The caution to be observed in prescribing belladonna plaster or ointment—an old warning, but one that can bear repetition. R. ABRAHAMS M.D.

An Explanation.

PHILADELPHIA, June 16, 1898.

To the Editor:—We note the letter recently addressed to your JOURNAL (May 28, p. 1391) by Dr. J. H. Davisson of Los Angeles, Cal., ex-president of the State Board of Health, relative to an irregular use of a recent report made by him, which was published in our antitoxin brochure about a year ago.

It was far from our intention to cause Dr. Davisson any annoyance, or to make any improper use of his name. It was not our intention to have it appear that the Doctor personally endorsed our product, but that the State Board of Health of California discriminated in favor of American antitoxin, and since, at the time our brochure was published, we were supplying, and have continued to supply, the California State Board of Health with Mulford's Concentrated Antitoxin, the statement as published in our brochure is correct. Our copy supplied the publisher, incorporated the above with a quotation from Dr. Davisson's report. Unfortunately, our instructions regarding the use of the bracket were not carried out. The article should have read according to our copy as follows:

CALIFORNIA STATE BOARD OF HEALTH.

The antitoxin used in California is made in this country and after considerable investigation and trial of the German and French products, we are giving our preference to the American production. The American product is put up in better form for transportation and handling, which is of itself an important item. [The antitoxin now used by the Board is that of H. K. Mulford Co. of Philadelphia. The concentrated "Extra Potent" (500 units to each c.c.) is the best.]

We extremely regret that the bracket was omitted in placing this matter in type. Certainly we did not intend to have it appear that our product was personally endorsed by Dr. Davisson, but the fact that the California Board of Health was being supplied with Mulford's Antitoxin at the time our brochure was published, makes the statement as apppears in our brochure, with the exception of the personal endorsement of Dr. Davisson, absolutely correct.

Thanking you in advance for the publication of this explanation, we are Very truly yours, H. K. MULFORD COMPANY.

Marine Hospital Service.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON GENERAL
MARINE-HOSPITAL SERVICE.
WASHINGTON, D. C, June 24, 1898.

JOURNAL AMERICAN MEDICAL ASSOCIATION, 61 Market Street, Chicago, Ill.

Sirs:—With the close of the present fiscal year, June 30, the subscription for eighteen copies of the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, for the use of this Service, will expire, and will not be renewed for the ensuing fiscal year. By direction of Supervising Surgeon-General, M.-H. S.

Respectfully yours,
PRESTON H. BAILHACHE, Surgeon M.-H.S.

ASSOCIATION NEWS.

Further Delay in Publication of Official Proceedings.

4 EAST 37, NEW YORK, June 21, 1898.

To the Editor:—Your telegram is at hand in regard to the resolutions and report of Executive Committee. I was more than half sick at Denver and could not write up the proceedings of the Executive Committee; in my book of notes there was an immense mass, and so put the book and all in my trunk to do it here at home. The trunk got separated from me and only reached me just now, and I have been overwhelmed with accumulated work that I have not yet tackled it, but will do so at once, and send on the resolutions, etc., very shortly.

In haste, yours sincerely,
L. DUNCAN BULKLEY, M.D.

SOCIETY NEWS.

American Academy of Railway Surgeons.—The next meeting of the American Academy of Railway Surgeons will be held in Chicago, Oct. 5, 6 and 7, 1898. D. C. Bryant, Secretary, Omaha, Neb.

Michigan State Board of Health.—The quarter-centennial celebration of the establishment of the Michigan State Board of Health, to be held in Detroit, will include addresses by leading sanitarians of this country. It will commence August 9, at 9 A.M., and continue throughout the day, there being three sessions, morning, afternoon and evening.

The Third International Congress of Applied Chemistry, Vienna, July 28 to August 2, will discuss the international unification of the methods of analysis for tests of products whose commercial value is based on their chemic constitution; also for tests to control various chemic industries; also instruction in chemistry and numerous other subjects of general interest. Secretary, F. Ströhmer, Schonburg Strasse, No. 6.

Annual Meeting.—The Annual Meeting of the White Mountains Medical Association, Connecticut Valley Medical Association, and White River Medical Association will be held at Hanover, N. H., July 29 and 30, 1898. The program includes: "Early Operation for Gall Stones," by W. H. Conant of Boston; "Racial Aspects of Disease," by Prof. C. D. Wells of Dartmouth College; "Fractures," by P. S. Conner; "Diagnosis of Pelvic Disease," by Paul F. Mundé; "Clinical Remarks on Treatment of the Eye," by David Webster, and a paper, subject unannounced, by Wm. H. Parish.

Oregon State Medical Society.—The twenty-fifth annual meeting of the Oregon State Medical Society was held in the parlors of the Imperial Hotel at Portland, June 2 and 3. The meeting was quite well attended, and the papers presented, although small in number, were of exceptionally high order. Several visitors were in attendance from outside of the State. The officers elected for the coming year were: President, C. H. Hall, Salem; secretary, William F. Amos, Portland; treasurer, Mae H. Cardwell, Portland. The next meeting will be held at Portland in June, 1899. After the close of the meeting a party of delegates from Oregon and Washington State Medical Societies left for Denver to attend the AMERICAN MEDICAL ASSOCIATION.

State and Provincial Boards of Health.—The thirteenth annual meeting of the Conference of State and Provincial Boards of Health of North America will be held in Detroit, Mich., Aug. 9, 10 and 11, 1898. The first day, August 9, will be given to meeting with the Michigan Quarter Centennial Celebration in effecting organization and hearing reports of committees; the second day to the subject: "What are the Principal Lines of Work of Your Board? How is Each Accomplished? What Modification, if any, does the Experiece in Your State Suggest?" The third day will be given to discussion of the various phases relating to the restriction and prevention of tuberculosis. The phases proposed are: 1. Etiology. 2. Morbid Anatomy. 3. Statistics. 4. Identity of Tuberculosis in Man and Animals and its wide Distribution among the Latter; also its Communication to Man through Food. 5. Economic Phases. 6. How may Tuberculosis be Prevented?

PUBLIC HEALTH.

Contagious Diseases.—No colonists affected with contagious diseases are allowed to settle in western Australia, according to a recent official decree.—*Sem. Méd.*, May 25.

An epidemic of measles has precipitated by a few weeks the closing of a school in the Borough of the Bronx, New York City.

The building has been fumigated, but it is not known when it may be reoccupied. The parents of over a thousand children are somewhat clamorous over the anticipated loss of educational advantages and are said to connive at the suppression of reports. The same old conflict between the individual and the State therefore still prevails.

The Complications of measles are liable to be much more serious in hospitals as the patients are exposed to contagion from streptococci which seem to acquire increased virulence in passing from one person to another. The contagiousness of measles during convalescence has been confirmed again by a number of soldiers recovering from scarlet fever, who were placed in a ward occupied by a few convalescents from measles, and all contracted measles, which suggests that disinfection is required also after this disease.—*Progrès Méd.*, May 21.

Fin de Siecle Milk.—An establishment has recently been opened at Berlin to supply "diabetes milk," made according to v. Noorden's formula: 1 per cent. sugar and 6 per cent. fat. Also Jaworski's "strength milk" for forced nutrition with passive exercise; 10 per cent. fat. But the main object is the production of milk for infants, made to correspond to mother's milk by diluting and centrifugalizing cow's milk and adding milk sugar, according to the formula of Professor Gaertner of Vienna.

Unification of the Statistics of American Cities.—A motion introduced in Congress through the Reform Club of New York authorizes the Commissioner of Labor to compile and publish annually as a part of the bulletin of his department an abstract of the main features of the official statistics of the larger cities of the country. The public are now dependent for their statistics upon local reports, which too often confuse and bewilder rather than make clear the criminal, vital and social facts they attempt to collate. The object of the present movement is to give uniformity of scope to these statistics and bring them together in one intelligent tabulation, or series of tabulations, as the commissioner's means will afford, and we trust that the Reform Club will bear in mind that this class of skilled work requires "the sinews of war" not less than the other lines of work assigned to the commissioner.

Yellow Fever.—Dr. Lacerda reiterates his assertions that it is possible and practicable to entirely eradicate yellow fever in a town by tearing down the old damp, sunless houses that are known to be foci of infection, and disinfecting those that it is impossible to destroy, as also the holds of vessels. The germs die in the sewers and in sunshine, the usual means of transmission being the air, and only in a circumscribed radius, although they can be carried in clothing, merchandise, etc. He concludes by stating that persons who have become acclimated to yellow fever may lose their immunity by an eight months' residence in a temperate climate.—*Gaz. Méd. de Bahia*, February.

Two new cases of yellow fever were reported at McHenry, Miss., June 20, a total of seventeen cases since May 20.

Insanitary Wall Papers.—The fact is of no small importance to be kept in mind that, though the unwholesome exhalations of papered walls mostly emanate from such papers as have a blue or a green ground, they also occur where the blue or green constitutes the largest part of the pattern, the dye stuff being chiefly composed of blue or green ultramarine. The latter is entirely harmless, but has the property of becoming decomposed by slightly sour liquids and diffusing a most disagreeable odor, a development of sulphuretted hydrogen during the slow process of decomposition. The paste used for fixing wall paper is frequently of a somewhat sour or readily souring character and quickly penetrates the paper, causing the above-mentioned effect, a very slight degree of fermentation sufficing to bring about the offensive result, and this appears, too, the more markedly if the walls are slightly damp and already covered with several layers of paper so that the lime plastering can not have a neutralizing tendency on the lactic acid in the paste, etc. In such cases, therefore, where it is necessary to affix wall paper on a ground of old paper, as well as in all cases where green or blue is used, it is recommended to employ only such gluing agents as do not sour, or if inclined to decomposition, contain slight quantities of lime, milk or soda solution before use.

Typhoid Fever from Ordinary Streams.—The secretary of the State Board of Health of Michigan has issued the following warning to young men and all who bathe in streams: Recent reports to the State Board of Health show that at least two cases of typhoid fever have been caused by drinking the water in or from the Kalamazoo River. In no case should water be used for drinking or culinary purposes from a river or stream into which sewage is emptied or privies are liable to drain; and as most of the rivers and streams of this State have towns situated upon or near their banks, from which sewage is received, and privies are liable to drain, therefore it is very dangerous to use the water from any of the rivers or streams for any culinary purpose whatever, except the water be first boiled, and it should not, in any case whatever, be drank, unless previously boiled. Cases have been reported where typhoid fever has been contracted by bathing in streams. Probably this will be most likely to occur through accidentally or carelessly taking the infected water into the mouth. Especially should no person bathe in any ordinary stream just below any city, village or other source of sewage or privy drainage.

NECROLOGY.

RICHARD CHANNING MOORE PAGE, M.D., died June 19, in Philadelphia, after about a week's illness. He was born at Keswick, Albemarle Co., Va., Jan. 2, 1841, the youngest child of Dr. Mann Page and Jane Frances Walker. After remaining in the University of Virginia until the close of the session in 1861, he entered the Confederate Army as an artillery man and served under Gen. Joseph E. Johnston and on the staff of Gen. John C. Breckinridge, where he remained until the end of the war. He was an active participant in the battles of Fredericksburg, Chancellorsville, Mine Run and Gettysburg, in the last of which he was severely wounded. Subsequent to the war he returned to the University of Virginia to study medicine, but removing to New York City in 1867, he received his medical degree from the New York University in 1868 and at once began his career in the eastern metropolis. He was indefatigable as a teacher and likewise wrote acceptably, "A Practice of Medicine," "Physical Diagnosis," "Sketch of Page's Battery," and the "Genealogy of the Page Family" being among his more important contributions. As a member of a large number of medical and historical societies he became widely known and appreciated.

JOHN S. MCGUIRE, M.D., Seattle, Wash., aged 65 years. Dr. McGuire had the honor of being one of the famous six hundred whose deeds are told in the "charge of the light brigade." He also received medallions and marks of honor for brilliant services at Inkerman in the Crimean War. In 1871 he resigned his commission in the British Army and after a short residence in Australia went to San Francisco, where he practiced for a short time. He came to Seattle in 1889, where he resided until the time of his death.

SAMUEL GRAHAM, M.D., Butler, Pa., died June 21, aged 62 years. He was a member of the class of 1862, Jefferson Medical College, and for thirty-three years one of the leading practitioners of Butler County, Pa.

EBEN JACKSON, M.D., Castleton Medical College, Vt., 1856, of Somerville, Mass., died June 22, aged 73 years. He served under Grant, and was in charge of hospitals at Memphis,

Vicksburg and elsewhere, at different times. From having participated in several battles he was known as a "fighting doctor," but at the close of the war he entered upon civil practice, in which he remained until his death.

J. B. JOHNSON, M.D., Allegheny, Pa., June 20, aged 61 years. ——Calvin D. McDonald, M.D., Kansas City, Mo., June 19, aged 63 years.——W. F. Miller, M.D., Louisville, Ky., June 17, aged 74 years.——W. F. Swisher, M.D., Woodburn, Iowa, June 23.——T. N. Cunningham, M.D., Princeton, Ill., June 22, aged 54 years.——E. J. DeRaismes, M.D., New York University, 1882, died at his home, Hudson Boulevard, Union, N. J., June 18, aged 39 years.——J. A. McCoy, Tacoma, Wash., aged 71 years.——W. W. Beach, M.D., Tekoa, Wash., aged 50 years.

BOOK NOTICES.

Twentieth Century Practice. An International Encyclopedia of Modern Medical Science, by Leading Authorities of Europe and America. Edited by THOMAS L. STEDMAN, M.D., New York City. In Twenty Volumes. Volume XIV, "Infectious Diseases." New York: William Wood & Company. 1898.

This volume is devoted, as its name implies, entirely to infectious diseases, viz.: Scarlet fever, measles, German measles, chickenpox, glandular fever, whooping-cough, cholera infantum, cholera nostras, Asiatic cholera, dengue, beri-beri, miliary fever and Malta fever.

The contributors to this volume are: Dillon Brown, M.D.; David Bruce, M.B., C.M.; Sir Joseph Fayrer, Bart., M.D., LL.D., F.R.S., F.R.C.P., R.C.S.; Frederick Forchheimer, M.D.; A. Jacobi, M.D.; A. Metter, M.D.; Nathaniel Read Norton, M.D.; Joseph O'Dwyer, M.D.; Theodor Rumpf, M.D.; A. A. De Azevedo Sodre, M.D.; Dawson Williams, M.D., F.R.C.P.

The high character of the contributors prepares us for the excellent quality of the work and one is not disappointed at the result.

This volume is a fitting companion of its predecessors in this magnificent series and one to which the reader may turn for complete information on this important class of diseases.

Aphasia and other Speech Defects. By H. CHARLTON BASTIAN, M.A., M.D. New York: D. Appleton & Company, 1898.

In this work the author has reproduced with additions the Lumleian Lectures delivered before the Royal College of Physicians of London, 1897, and published in the *Lancet*. These lectures form parts of chapters 1 and 2, and nearly the whole of chapters 6, 8 and 9. Chapter 7 was the Clinical Lecture delivered at the University College Hospital, which appeared in the *Lancet* for September, 1897. With these exceptions the remaining matter is entirely new.

This author, who is well known in other biological fields, in this volume is seen at his best. Nothing unnecessary, nothing redundant, the sentences go straight to the mark with the practiced skill of the literary expert. The student wishing to acquire knowledge of this interesting disease, and the practitioner wishing to refresh his memory and gain additional knowledge, will be charmed with this work by Bastian, and as of its accuracy there is no question, we have no doubt about its reaching permanent popularity.

Modern Gynecology. A Treatise on Diseases of Women, comprising the results of the latest investigations and treatment in this branch of medical science. By CHARLES H. BUSHONG, M.D. Illustrated, second edition and enlarged, pp. 404. New York: E. B. Treat & Company. 1898.

A man who inflicts on the profession a work on gynecology at a time when our shelves are loaded with them, should either have something very new and striking, or else apologize for writing the work. The older authors usually commenced their work with an apology for having written. Careful examination of this work does not show any very particular reason for its publication, although its statements are clear, the illustrations are good and the compilation of existing knowledge fair.

The old dosage, however, is used in the prescription writing.

Diseases of the Stomach. A text-book for practitioners and students. By MAX EINHORN, M.D., Instructor in Clinical Medicine at the New York Post-Graduate Medical School and Hospital; Visiting Physician to the German Dispensary. Second Revised Edition. 502 pages. Price, cloth, $3.25 *net*; flexible leather, $3.75 *net*. New York: William Wood and Company, 1898.

Members of the ASSOCIATION will remember with pleasure demonstrations of gastro-diaphany made in the ASSOCIATION meeting by the author of this work, and it may be said that since that time medical literature has been enriched by a large number of treatises on the subject. The first edition was a thorough exposé of the existing state of knowledge on the subject.

This edition is not materially altered from its predecessor, which was published late in 1896, and in our notice of that edition we took occasion to commend the work, a commendation in every way merited.

Manuali Hoepli: Spiritismo. Di ARMANDO PAPPALARDO. Milano: Ulrico Hoepli. 1898.

Magnetismo e Ipnotisma. Per il DOTT. G. BELFIORE. Milano: Ulrico Hoepli. 1898.

These are two of the more recent of the little pocket manuals issued by the Italian house of Ulrico Hoepli. The first of these discusses the phenomena of spiritualism in rather a more respectful manner than an American medical author would; the second is a discussion of the phenomena of hypnotism according to the latest European literature of the subject. Both are compilations, but such have a very useful function and will probably be serviceable to those who can read them. While spiritualism has interest only as a psychic aberration, and some of the literature of hypnotism also has in it a larger element of human credulity than is consistent with genuine science, such manuals as these are not without interest, and that on hypnotism appears to be on the whole a fair statement of verified facts.

A Manual of Instruction in the Principles of Prompt Aid to Injured, including a Chapter on Hygiene and the Drill Regulations for the Hospital Corps for the U. S. A. Designed for Military and Civil use, by ALVAH DOTY, M.D. Second Edition, New York: D. Appleton Company, pp. 302, 1898.

The second edition of this Manual presents a thorough revision and some enlargement.

A chapter on Hygiene has been introduced, and a chapter on the recently adopted Drill Regulations for the Ambulance Corps of the U. S. A. has been added. National guardsmen, railroad employes and those exposed to accident will find the book of great value.

Transactions of the American Association of Obstetricians and Gynecologists. Vol. 10, pp. 483, Philadelphia: Wm. J. Doran, 1898.

This volume includes the minutes of the meeting and the papers read at the meeting at Niagara Falls, New York, August 17, 18, 19 and 20, 1897. The exhibition of specimens presented with their illustrations occupies an important place in the work. Obituary articles on the late Traill Green, Fletcher D. Mooney and James Greig Smith of England, are included in the volume, which is only just to say surpasses its predecessors. The illustrations are finer than those usually found in volumes of transactions.

Atlas and Essentials of Pathological Anatomy. By Dr. O. BOLLINGER. Volume II. Urinary Apparatus, Sexual Organs, Nervous System and Bones. With 63 colored figures upon 52 plates and 17 illustrations in the text. Pp. 252. New York: William Wood & Co. 1898.

This excellent series of atlases has a valuable addition in this volume by Bollinger. The plates are prepared from the actual specimens and the coloring is strikingly natural. For reference this atlas is invaluable.

MISCELLANY.

The Monument to Pasteur in front of the Pantheon in Paris is now almost completed. The sculptor, M. Falguière, has added a group of a mother with her child thanking Pasteur, whom Fame is in the act of crowning with laurels. The international subscription to the memorial, according to the *British Medical Journal*, now approaches £13,000.

Anal Imperforation in a newborn infant that required an iliac anus was followed by intestinal prolapsus. Kirmisson then introduced a sound through the artificial anus into the lower intestine, working it through to the perineum, and successfully re-established a normal anus. The infant, four days old, was presented at a recent meeting of the Paris Acad. de Méd.

Etiology of Pertussis.—The results of recent research by R. Behla confirm the announcement of Deichler and Kurloff that the micro-organism of this affection is not a bacterium but an ameba belonging to the protozoas, propagating by division and spore-formation. It is not found in the blood nor epithelium and does not grow inside the cells.—*Deutsche Med. Woch.*, May 12.

The Presence of an Antitoxin in the bile of animals dying from the cattle plague has been established by Koch, and now by E. I. Frantzius in regard to animals dying from rabies. The introduction of equal parts of bile and cerebral substance derived from the same rabid animal, rabbit, introduced under the dura mater of another rabbit, was not followed by any morbid manifestations, but if the bile had been taken from a non rabid animal, the rabbit promptly succumbed to rabies.—*Wratsch*, April 18.

Reform at Bellevue Hospital.—The Commissioner of Charities of New York has decided to reorganize the staff of the chief hospital. He hopes to so select the staff that educational interests will be conserved, but he purposes to break up the "practical monopoly," as it has been called, of the great schools. Inasmuch as there will be candidates forthcoming in number sufficient to fill ten such staffs, it can well be understood that his self-assumed lot will not be a happy one for some time to come.

Iodin in the Blood.—Gley asserts that the iodin discovered by Baumann in the thyroid gland is in reality derived from the blood. His research has resulted in establishing the presence of iodin in the blood, stored in the red corpuscles, but only in adult animals.—*Semaine Méd.*, May 25.

The Latin-American Scientific Congress opened auspiciously in Buenos Ayres in April with 110 members inscribed and crowded attendance. A number of interesting and valuable communications were presented on hygienic and medical subjects by delegates from the various Latin-American countries. We note among them that cancer seems to be increasing in South America as rapidly as elsewhere. In Buenos Ayres it has risen from 91 in a thousand deaths to 115, in the last twenty-six years. The next Congress will convene at Montevideo in 1901.

Intestinal Stenosis Consecutive to Gangrene Cured by Entero-anastomosis Without Resection.—J. Schulz reports a case in which eight days after the dark blue loop of intestine had been reduced during herniotomy, symptoms of severe stenosis appeared, fecal vomiting, pain, etc. It was found that the stenosis, ten centimeters in length, involved the whole of the intestine that had been incarcerated. On account of the threatening general condition he abstained from resecting and merely performed an entero-anastomosis, which proved perfectly successful. Only two similar cases are on record.—Garré and Maas; *Münch. Med. Woch.*, May 17.

Bone Clamp and Fracture.—Parkhill (*Annals of Surgery* for May) presents a method for the fixation of the fragments in recent fractures where there is a tendency to displacement, and ununited fractures after resection, and in fractures with malunion after resection, with reports of a number of cases. He claims for his instrument that union has been secured in every case in which it has been used; that it is easily and accurately adjusted; that it prevents both longitudinal and lateral motion between the fragments, and that the presence of the shafts in the bone stimulates the production of osseous tissue; that nothing is left in the tissue to reduce their vitality or cause pain and infection, and no secondary operation is necessitated.

Mr. David H. King Jr. of New York, has offered to the Red Cross relief committee his house at Jekyl Island, S. C., for use as a hospital. Judging from the newspaper illustrations, the surroundings are unexceptional and the residence itself already built on the pavilion plan. Jekyl Island is within an hour's travel of Fernandina, Fla., and its healthfulness and location make it an ideal site for an army hospital. Soldiers becoming ill at the camp which, it is reported, will be established at Fernandina, can be easily taken to this island. It is also conveniently situated for the care of soldiers wounded on Cuban battlefields. Not only will Mr. King give the use of the house for hospital purposes, but he will maintain it as well.

The New York Post-Graduate Hospital.—In the case of Dr. Charles B. Kelsey, who was removed from a professorship in the New York Post-Graduate Hospital by a majority vote of the Board of Directors of that institution, the appellate division of the supreme court has reversed the decision of the special term directing his reinstatement. The higher court holds that the Board has power to remove a member of the faculty by a simple majority vote, in cases where no charge of misconduct was made, but that a vote of three-fourths was necessary to effect a removal upon charges. In the first instance, the power is declared to be absolute, and in the second it is judicial. "It seems reasonable," says Mr. Justice Marrett, "that a majority vote should have been deemed sufficient for a removal at pleasure, while a three-fourths vote should have been required for a removal upon charges. When a professor is removed at pleasure, no stigma attaches to the act of removal. His services are no longer required and he is told so. That is what, in substance, such a removal amounts to."

Stagnation of Stomach Contents.—Benedict (*Medicine*, May) in discussion of this subject includes the following diseases: Atony, slight dilatation (the usual condition in cases called gastroptosis), true dilatation due to essential weakness and stenotic dilatation, from cancer, ulcer, fibroma, or external pressure involving the pylorus. Hour-glass contraction may fall either under the second or third. Stenotic dilatation is most frequently found with pyloric cancer and next with cicatrizing ulcer at the pylorus, or it may be first ulcerative and then malignant. Malignant diseases may sometimes have no obstructive bearing on the dilatation.

Glossitis in Typhoid Fever.—In the *Johns Hopkins Hospital Bulletin* for May, McCrea reports a case of glossitis complicating typhoid fever, which occurred in the Johns Hopkins Hospital, the first such case in over seven hundred cases of typhoid fever there. He considers it of especial interest in that it occurred during convalescence from the original attack and ushered in a relapse, being apparently the first symptoms of the relapse after twenty-four days of normal temperature. The relapse itself was mild except for the severe onset, and no further trouble in swallowing affected the patient after subsidence of the swelling. Diminution of the swelling in the left half of the tongue followed after the removal of the blood for cultures, and he considers this a support of the value of free incisions into the tongue in severe cases.

Motor Neuron.—In *Medicine* for May, Patrick of Chicago writes on "Motor Neurons in Practical Diseases." He finds that, "A lesion of any part of the lower motor neurons causes

paralysis, flaccidity, atrophy, loss of the deep reflexes, and reaction of degeneration. A lesion of any part of the upper motor neurons causes paralysis, spasticity, no atrophy, exaggeration of the deep reflexes and no change in the electric reactions."

Professor Senn to go to the Front.—It is announced in army medical circles that the regular troops of the Fifth Army Corps will shortly have the benefit of the professional services of Col. Nicholas Senn. Since his appointment and muster Colonel Senn has been at Chickamauga, organizing the medical department of one of the army corps there stationed; but it is considered that his services could be employed to much greater advantage in the field hospitals near Santiago, Cuba. It is probable that he will be assigned to special duty with General Shafter's command. The chief surgeon of the corps is Lieut.-Col. Benjamin F. Pope, United States Volunteers.

Movements of Medical Officers.—Captain John L. Phillips, Assistant Surgeon U. S. Army, just returned from the Pacific Coast, has been assigned to the 2d Army Corps at Camp Alger, Virginia; Acting Assistant Surgeon, Medwin Leale, has been placed on duty with the cavalry squadron at headquarters of the Corps, and Assistant-Surgeon Whitmore Steele, 8th N. Y., has resigned on account of physical disability. Three medical officers have been sent to the 3d Corps at Chickamauga, Ga.; Captain Chas. B. Ewing, U. S. A., from Tampa, Fla., Captain Adrian S. Polhemus from Fort Wingate, New Mexico, and Captain John S. Kulp from his late station on the Pacific Coast. Two officers have been ordered to report to General Fitzhugh Lee, commanding the 7th Army Corps at Jacksonville, Fla.; Captains Paul Clendenin and Henry S. T. Harris. Changes at the hospitals are: Captain H. A. Shaw, U. S. A., from the general hospital at Key West to Key West barracks, Fla.; Captain R. S. Woodson, U. S. A., from the ambulance train at Tampa, Fla., to the hospital at Fort McPherson, Ga., and Acting Assistant Surgeon, John R. Devereux of Washington, D. C., to the Leiter Hospital at Chickamauga, Ga.

Medical Appointments Confirmed.—Dr. L. L. Seaman of New York to be Surgeon of the 1st Regiment of Engineers. Dr. Seaton Norman of the U. S. Marine-Hospital Service to be Surgeon of the 3d Regiment of Volunteer Infantry. Drs. John W. Cox and Zachary D. Massey of Tennesse to be Assistant Surgeons of the 6th Regiment of Volunteer Infantry. Drs. M. Landry of Louisiana and R. T. Burr of California to be Assistant Surgeons of the 7th Regiment of Volunteer Infantry. Dr. James H. Hepourn of the District of Columbia to be Surgeon of the 8th Regiment of Volunteer Infantry. Dr. A. Pallones of New Jersey to be Surgeon of the 9th Regiment of Volunteer Infantry. Dr. Wm. M. Fuqua of Kentucky to be Surgeon of the 10th Regiment of Volunteer Infantry.

An Army Hospital on Wheels.—Major Charles Richard, Surgeon U. S. Army, has been in Washington, D. C., recently superintending the outfitting of the R. R. Hospital train to the command of which he has been assigned. The train left for Tampa, Fla., June 17, by way of the Southern Railway to Columbia, South Carolina, and over the Florida Central and Peninsular to its present field of duty. It consists of ten Pullman sleeping coaches, a dining car, a cooking car and a combination coach, and is well equipped with such medical and surgical supplies and apparatus as would be likely to be of use while on the road with sick and wounded. Major Richard is assisted by Captain H. R. Stiles, Assistant Surgeon U. S. Army, with two hospital stewards, three cooks and twenty-two nurses of the hospital corps of the army. From time to time as may be required a section or the whole of the train will return with sick and wounded, who will be conveyed to one or other of the army general hospitals; and when not en route the train will be used as a receiving general hospital at the port of connection with Cuba. Ambulant hospitals of this kind were in use during the last eighteen months of the Civil War. In 1864, when General Sherman was at Atlanta, Ga., three trains ran regularly between that place and Louisville, Ky., a distance of 472 miles.

Surgeon-General Sternberg on the Danger from Yellow Fever.—In a letter to the *Army and Navy Journal*, Surgeon-General Sternberg expresses his views of what would happen if we should send an army to occupy any of the infected Cuban ports during the unhealthy months. He says:

In your issue of April 23, page 642, the statement is made that Gen. Sternberg "expresses confidence in the excellent sanitary provisions of the military service and does not fear that yellow fever will prove more harmful to the troops than diseases which are common in the northern latitudes," etc. I have not expressed any such optimistic opinion, and regret to say that it is not justified either by my studies relating to yellow fever or by my personal experience. History teaches that when a considerable number of unprotected persons are exposed in a yellow fever infected locality during the months when this disease is most prevalent (May 1 to November 1, in the latitude of Havana), an epidemic almost infallibly results. In the last week in April of last year, there were seventeen deaths and seventy new cases of yellow fever in the city of Havana. Now, suppose that we had a similar number of cases at the same season in New Orleans and that 20,000 strangers from the North should go there to spend the summer, what would be the result? All past experience supports the belief that a majority of them would have yellow fever, and that from 20 to 40 per cent. of those taken sick would die. This is what I anticipate would happen if we should send an army to occupy Havana, or any other infected seaport on the coast of Cuba during the summer months. If, however, these troops could be camped upon high land in the interior, and circumstances were such as to enable them to comply with all of the exactions of modern sanitary science, I am of the opinion that our loss from yellow fever would not be serious. But in time of war military commanders are expected to take their troops to the points occupied by the enemy, and a picnic in the interior with frequent changes of camp, etc., is perhaps not exactly what we may expect. I am not an alarmist, but I believe in looking facts fairly in the face, and can not allow your statement of my opinion to have currency at such an important moment in our country's history without a protest.

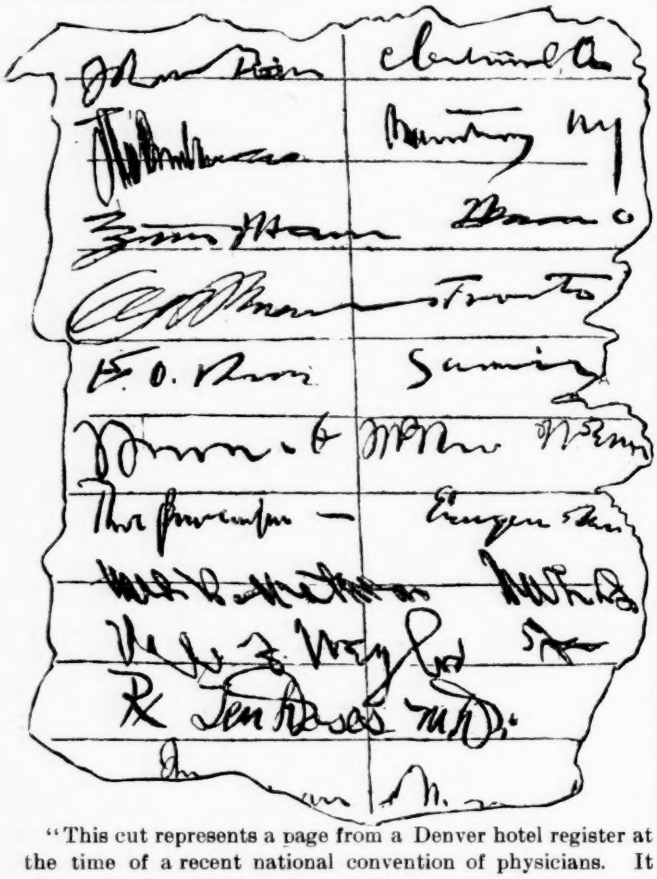
Transient Agrypnic Delirium is the term proposed by Agostini for the psychosis observed after prolonged insomnia. He cites a couple of serious cases, both recovering after a couple of days sleep, and describes experiments with two healthy dogs kept awake for two and three weeks. The central nervous system showed the same histologic alterations as after intoxication with arsenic, lead, alcohol, etc., and he assumes that in the same way psychoses such as mania, lypemania and mental confusion, hitherto considered essential morbid forms, *sine materia*, are frequently of autotoxic origin, the result of lesions of the nerve cells produced by the action of the autochthonous poisons of the organism.—*Semaine Méd.*, May 14.

X-Rays in Medicine.—Williams (*Medical News*, May 14) says that in making the diagnosis, "Physicians will find that although much that the X-ray reveals can be recognized by other means it would often be an advantage to have this information confirmed by another method, and we must also appreciate that it can extend our knowledge into a field which was previously beyond our reach." By the X-ray alone, in certain cases, aneurysm, emphysema and pneumothorax, diagnosis may be made, but as a rule it is only one method and should be used only in connection with others. In suitable cases the X-ray gives earlier evidence of disease than the older methods. He finds it indispensable in making a complete examination in diseases of the chest where they completely change the diagnosis previously made.

Widal Test.—Blackburn (*Medical News*, May 7) makes a report concerning this test in typhoid fever from data obtained during his service in the Presbyterian Hospital in Philadelphia, May to October, inclusive, 1897. In all suspected cases of typhoid fever, the blood was subjected to this test, and a specimen was taken immediately on admission of the

patient to the hospital, the object being to find the first day of the disease on which the test was positive. In eighty cases of enteric fever, as established by the clinical course, the test was positive except in two. In one case of catarrhal fever the test was, on the seventh and ninth days negative, eleventh and thirteenth days doubtful, and positive on the fourteenth day. In one case of uremia positive reactions were secured twice. This patient had had typhoid fever five years before. In one case of catarrhal, having had typhoid three years before, there was a positive reaction. He concludes that it is a good corroborative test; in doubtful cases early in the disease it does not assist in diagnosis, and that in severe cases test is positive early, yet in a few typic cases it appeared to be negative.

Why Prescriptions Go Wrong.—Here is a squib from one of the New York City evening papers, one of the saffron-colored variety of which you have heard:



"This cut represents a page from a Denver hotel register at the time of a recent national convention of physicians. It shows why drug clerks make mistakes in prescriptions."

A Research on Precocious Gestation.——Dr. Sage of Bordeaux recently delivered by means of forceps, a girl aged 13 years and six months, of a male child at term weighing eight and a half pounds. The mother seems to have become pregnant a month after her first menstrual period. There was nothing abnormal regarding the puerperium. This has led Dr. Sage to look up the subject of early pregnancies, which are less common in France than in other European countries. He has been unable to find any mention of a case occurring at so early an age as his own in recent medical literature, the earliest being at the age of 14 years and one month. In a medical dictionary published in 1823 mention is made of girls having been received into the Paris lying-in hospitals at 13 years of age, and during the Revolution at 11 years, and even before that age. The earliest cases recorded in other countries are Molitor's case in Luxemburg, where a child aged eight years and three months, became pregnant and was delivered of a mole containing a dead fetus seven months afterwards (this was in 1877); Outrepont's case (1825) of a German girl, aged 8, who aborted in her fourth month; Haller's case in Switzerland of a girl born in 1751 and delivered in 1759, and Dodds case in England (1881), where a Yorkshire girl, aged nine years and eight months, was delivered of a living child at term. Here the young mother had menstruated from twelve months of age.—*Lancet*, April 23.

Cost of the Hospital Ships.—The Government has paid more than $1,000,000 for the two hospital ships, the *Solace* and the *Relief*, $450,000 being to the Maine Steamship Co. for the *John Englis*, renamed the *Relief*. The price paid to the Cromwell Line for the *Creole*, now the *Solace*, was $600,000, making a total of $1,050,000 for the two hospital vessels. The estimated cost to the War Department for fitting up the *Relief* is $50,000, in addition to many things which are to be presented by various organizations which are working to aid in reducing the horrors of war as much as possible. An army officer said that about twice as much had been expended in fitting up the *Solace*, as the Navy Department had a special appropriation for the purpose and also greater facilities for doing work upon ships, as it controlled the navy yards. The total expense of procuring and equipping the two vessels will not be far from $1,250,000. This amount would be increased 50 per cent. if a third vessel should be purchased and equipped, as would be necessary if an expedition was sent to Porto Rico. "It would bankrupt the Department," said an army surgeon yesterday, to get another hospital ship; but one will be needed for any additional expedition. The English Government sends a hospital ship with every military expedition. We have never had to send one beyond the confines of our own country, but in the Civil War transports were used to convey the wounded to points from which they could be readily transferred to hospitals on land. There has been a noble response to the request for gifts to fit up the hospital ship with all that can be put aboard to aid the work of the surgeons and nurses. We hope to have the vessel fully equipped and ready for us in five weeks from the time she was turned over to the Government, but it will depend on the speed of the contractors. The most important things are being done first, so that if a sudden emergency arises the vessel can answer a call for its services. The staff of physicians has been engaged, there have been six female and ten male trained nurses secured, while from the hospital corps of the army men have been secured who will do the heavy work of lifting patients and attending to the wards, while they will be trained in nursing, so as to relieve the regular staff and assist when the vessel has many patients. We may get orders any day to start as soon as possible, and everything is being made ready."—*N. Y. Tribune*, June 20.

The War Revenue Law.— . . . The new law requires that every medicinal preparation shall be subject to the stamp tax, excepting: 1. Physicians' prescription medicines. 2. Extemporaneous preparations put up "for any person" by a retail druggist. 3. Uncompounded drugs or chemicals. 4. Non-proprietary preparations which are not put up "in style or manner similar to that of proprietary medicine in general," which is presumably intended to mean galenic preparations which bear on their labels only their official names and nothing concerning their properties, uses or any claims to superior virtue. The preparations specifically included, according to the evident meaning of the act, comprise: 1. All medicinal articles having a trade-marked name, or in which proprietary rights are claimed. 2. All medicines compounded according to a secret formula. 3. All medicines advertised on their labels or otherwise as remedies or specifics for any ailment, which includes all ready-made preparations of the retail druggist, all the "non-secrets" and all "patent" medicines. 4. All preparations of whatsoever nature which are put up in style or manner similar to that of a proprietary medicine. In brief, the act subjects to tax ready-made preparations of whatsoever description, excepting those only in which no proprietary right is claimed and which bear on their labels simply their recognized descriptive names. The act is in some particulars very

loosely phrased, and will give rise to much misunderstanding and litigation. What, for instance, is the "style or manner of a proprietary medicine" package? Are phenacetin, antipyrin and the myriad other German chemicals subject to tax? It is true they are vended "under letters patent and trade mark," but the special proviso in Section 20 declares that "no stamp tax shall be imposed upon any uncompounded medicinal drug or chemical." These German chemicals are "uncompounded" and, it would seem, therefore are made the subjects of specific exemption. Should the internal revenue office so rule and these products of all others escape taxation, the tide of protest would indeed be loud and deep. The law took effect July 1. By special provision, goods in retailers' stock on that date will not be subject to tax, but will require stamps only as they are actually sold. . . . No reason can be given for taxing non-secret medicines which does not equally apply to non-secret foods and other merchandise. No reason can be given for taxing non-proprietary medicines that does not as forcibly apply to other non-proprietary products. Why then this discrimination against druggists' merchandise and the drug store? . . . Many reputable manufacturers are carefully canvassing the situation with a view to bearing their fair share of these war taxes. The profit margin in numerous products is too small to justify the retention of present prices. The intelligent pharmacist will know how and when to discriminate between a justifiable and reasonable advance and an arbitrary and extortionate demand for further tribute. In the former class are few products adapted for manufacture in the retailer's laboratory; it is in the latter class where the injustice will quite invariably be found and where the remedy is at hand.—*Western Druggist.*

Wax in the Tubercle Bacillus.—Aronson has been experimenting with large quantities of bacilli grown on glycerin bouillon and also on Proskauer's mineral medium. He found that treating 300 grams of the bacilli with ether and alcohol resulted in securing a brown tenacious substance, representing about one-fourth of the original mass, assumed by Klebs and others to be fat. Closer chemic analysis, however, has proven that this substance only contains 17 per cent. of free fatty acids, while the rest is true wax, which stains with carbol-fuchsin. The wax is also found in diphtheria bacilli, but not more than 3 to 5 per cent. of the total bulk, and it it not affected by the fuchsin in the same way. After the wax is extracted from the tubercle bacilli, if they are treated with 1 to 50 sodium, and compressed at a temperature of 130 degrees C. according to Behring's method, a very powerful toxin results. It can also be obtained without the heating, but in smaller amounts.—*Berlin med. Gesellsch.*, Session of May 11.

Colleges.

Hamline University, Minnesota, graduated a class of twelve from the medical department June 9.——The graduating class of Harvey Medical College, Chicago, at the annual commencement held June 15 numbered eighteen.——At the annual commencement of the University College of Medicine, Virginia, there were forty-nine graduates in medicine.——Beginning with the next school year the Medical College of Niagara University will be consolidated with that of the University of Buffalo, N. Y.

Hospitals.

The Jamaica Emergency Hospital Association, New York City, dedicated the new hospital building on June 18.——The Lackawanna (Pa.) Hospital has received $950 from the estate of William T. Smith.——The new wing of the Cook County Hospital, Chicago, a three-story brick structure was opened for use June 20.

Philadelphia.

Philadelphia Hospital Overcrowded.—From time to time it has been suggested that it would be best to separate the almshouse from the hospital department of this institution, but up to the present time nothing has been done and the patients keep the managers busy providing the necessary room. The Mayor of the city has suggested consolidation of all the poor districts in the county of Philadelphia and placing them under the care of the Department of Charities and Correction. Further, that while the almshouse is at present overcrowded some of the district poorhouses in the suburban sections of the city have comparatively few inmates and therefore could be used to advantage in caring for some of the patients now at Blockley. It seems that the insane department is most pressed for room and that while 1050 cases are being cared for, the facilities are entirely insufficient. Since all of the State institutions are taxed to their utmost with these unfortunates, they can not be removed from this city and the question regarding their final disposition is still an open one.

Ptomain Poisoning.—In previous issue of the Journal, notice has been taken of several cases occurring in Philadelphia. During the week just passed two households consisting of nine persons have also been poisoned in this manner. The first cases resulted from eating pork, the second from oysters, and it is now recorded that ham is responsible for the illness of these latter cases. In the early part of the week these all partook of boneless ham which seemed fresh, but within a few hours all became ill and suffered with intense pains in the abdominal region and accompanied by nausea and vomiting. A physician called in pronounced it ptomain poisoning. A day or two later another family bought ham from the same grocer and after the two elder sons had eaten of it for lunch they were shortly afterward likewise afflicted. The following morning two daughters and a younger son ate of the ham and were shortly afterward seized with similar symptoms. The attending physician pronounced the cases ptomain poisoning. All the cases terminated favorably.

Bad Water.—After weary months of incessant toil, after constant vigilance by the physicians of Philadelphia and after the worst epidemic of typhoid fever possibly ever known here the City council has been forced to pass the "Loan Bill" which was voted by the people a year or two ago. Much praise should be given to those who entered personally into the fight and brought to light the underhand dickerings of the councilmen. Dr. William Pepper and Dr. John K. Mitchell were among the most earnest workers along this line. Of the $11,200,000 which will now be expended in greater Philadelphia, several million dollars will be spent in erecting and maintaining a proper filtration system. It is also gratifying to know that a large portion of this amount will be spent in the equipment of a large museum and also that the condition of the health of the people will be further improved by the construction of better streets and sewage systems.

For Free Cuba.—In the death of Dr. John Blair Gibbs, who fell at his post of duty in Guantanamo, the University of Pennsylvania loses a worthy son and the United States Army a valuable assistant. Dr. Gibbs was graduated at the head of his class in this institution in 1881, and for several years made this city his home. Some time afterward he moved to New York and entered the Bellevue Hospital, serving on the resident staff. Subsequently he matriculated at the College of Physicians and Surgeons, N. Y., and was graduated in 1882. When the first call to arms was sounded he responded and is the first army surgeon to sacrifice his life for free Cuba.

Weather in Philadelphia.—There were three deaths and four prostrations as the result of the intense heat for the week ending July 18. In several cases the patient had suffered with heart trouble and the effects of the heat acted more remotely. Later the weather has become more pleasant and enteritis and cholera infantum has not been manifested to a very great degree.

THE PUBLIC SERVICE.

Appointments, Assignments, etc., of Medical Officers.—To the 1st Corps at Chickamauga, Ga.: Capt. Henry P. Birmingham, U. S. A. To the 2d Corps at Camp Alger, Falls Church, Va., as brigade surgeons: Major Wm. H. Devine, U. S. Vols., to report to Major General Graham, brigade not specified; Major Peter D. McNaughton, U. S. Vols., to report to General Duffield; Major George W. Crille, U. S. Vols., to the 2d brigade, 1st division. To the 3d Corps at Chickamauga, Ga.: Capt. Eugene L. Swift, U. S. A. To the 4th Corps, General J. J. Coppinger, at Tampa, Fla.: Major W. Fitzhugh Carter and Capt. P. R. Egan, U. S. A. To the 7th Corps, General Fitzhugh Lee, at Tampa, Fla.: Major Geo. T. Vaughan, U. S. Vols., brigade surgeon, and Capt. Jefferson R. Kean, U. S. A. To the Philippine expedition: Lieutenant Franklin M. Kemp, U. S. A.; Acting Asst. Surgeons C. F. de Mey from Louisville, Ky., and A. E. Halstead from Chicago, Ill. To the Leiter Hospital: Major John W. Bayne, U. S. Vols., brigade surgeon, and Acting Asst. Surgeon Edwin P. Hayward. To the general hospital at Ft. McPherson, Atlanta, Ga.: Capt. Chas. E. B. Flagg, U. S. A.; the order sending Capt. R. S. Woodson, U. S. A., to this hospital was revoked. To the hospital train under Major Charles Prichard, U. S. A.: Capt. H. R. Stiles, U. S. A. From the hospital ship *Relief* to Ft. Slocum, N. Y.: Acting Asst. Surgeon Thomas A. Smith. From Washington Bks., D. C., to San Francisco, Cal., accompanying a battalion of artillery: Acting Asst. Surgeon S. Melville Waterhouse, returning thereafter to his station.

Resignation.—Major G. Frank Lydston, 2d Illinois Vol. Infantry.

Nominations.—1st Vol. Infantry: Wm. F. Starley of Texas as Surgeon and Henry A. Ingalls of Texas as Asst. Surgeon. 3d Vol. Infantry: James A. Toole of Georgia, as Asst. Surgeon. 9th Vol. Infantry: James Mitchell of Pennsylvania and Joseph T. Scott of Louisiana, as Asst. Surgeons. 10th Vol. Infantry: Thomas McCormick Lippitt of Virginia, as Asst. Surgeon.

Nominations confirmed—Dr. Edward Martin of Pennsylvania and Dr. Ernest Taylor Tappey of Michigan, to be brigade surgeons with the rank of Major. Wm. F. Starley of Texas to be Surgeon, Heny A. Ingalls of Texas and James Greenup Boyd of Texas, to be Asst. Surgeons of the 1st Regiment of Volunteer Infantry. Joseph A. Guinn of Georgia, to be Asst. Surgeon of the 3d Regiment. Frank P. Robinson of Tennessee, to be Surgeon of the 6th Regiment. John F. Dunshire of Louisiana, to be Asst. Surgeon of the 9th Regiment; and George N. Stoney of Georgia and John C. Dysart of Texas, to be Asst. Surgeons of the 10th Regiment.

An Inspection of the Army Medical Department in the Field.—Colonel Charles R. Greenleaf, chief surgeon of the army in the field, has recently returned to headquarters in Washington, D. C., from an inspection of the medical department in the camps at Chickamauga, Ga., and other points. He expresses himself as well satisfied with the progress made under the many difficulties with which chief surgeons had to contend. He found the health of the troops to be remarkably good, the aggregate percentage of sick to the effective force being less than 1 per cent. in General Lee's command and only a trifle over 2 per cent. at Tampa, Fla., and Mobile, Ala. It is probably about the same at Chickamauga, Ga., and Falls Church, Va., although absolute figures could not be obtained at these places because of the inability of corps surgeons to obtain records from regimental medical officers. From an examination of regimental books, Colonel Greenleaf satisfied himself that the rate of sickness was not much greater than in regular army commands. The diseases were generally those of the digestive apparatus, due to change of habits and unavoidable errors of diet and cooking incident to this early stage of the field service. There were also a few cases of pneumonia and typhoid fever, measles and mumps. Infectious cases were promptly isolated and measures were taken to prevent the spread of the disease. The advantage of caring for those who are seriously ill in general hospitals rather than in the field hospitals, is very manifest. The Surgeon-General has established general hospitals at the McPherson Barracks, Atlanta, Ga., to receive the sick from Tampa, Mobile and Chickamauga, and at Fort Myer, Va., for the care of serious cases from Camp Alger, Falls Church, Va. In addition to these there is the Leiter Hospital, capable of accommodating 400 or 500 patients, adjacent to the grounds at Chickamauga. The transfer of sick between the camps on the southern coast and these hospitals is effected by the hospital train of ten tourist sleepers, one dining and one dispensary car, Major Charles Richard, U. S. Army, in charge.

Mounts for the Hospital Corps.—An order issued from Headquarters of the Army, June 22, 1898, specifies the allowance of horses for mounts, wheel transportation, tentage, etc., for the Medical Department of the Army in the field:

	Hospital stewards.	Acting hospital stewards.	Privates.
To each regiment of infantry	1	1	1
To each artillery battalion (3 light batteries)		3	1
To each cavalry regiment	1		2
To each corps headquarters	1		2
To each division headquarters	1		1
To each brigade headquarters	1		1
To each division ambulance company	1	3	12
To each corps reserve ambulance company	1	3	12
To each division field hospital	2	2	6
To each corps reserve hospital	2	2	6

Wheel transportation.—One ambulance to 400 men of the effective force. One 4-horse wagon to 600 men of the effective force. One 4-horse wagon to each brigade.

Tentage.—For each ambulance company: 17 common tents for privates; 2 common tents for noncommissioned officers. For each division field hospital: 15 common tents for privates; 2 common tents for noncommissioned officers; 1 common tent for supplies. Hospital tents on a basis of 6 patients (beds) to each tent. Hand litters, with slings, to be furnished by the Quartermaster's Department: 1 for each company; 2 for each ambulance.

Regimental Bands as an Ambulance Corps.—The Assistant Adjutant General, U. S. forces, has issued orders to the following effect, that all members of regimental bands will be instructed in hospital drill and as much of first aid to the injured as is practicable under existing circumstances. To this end all musicians will hereafter report to a medical officer attached to the regiment to which the band belongs for one hour each day for instructions until they are pronounced qualified by the medical officer who instructs them. This arrangement will add largely to the numerical force and efficiency of first-aid bearers upon the battlefield. Men will be needed who know how to handle a wounded man so as to place him with care and expedition upon a litter and transport him smoothly and without jolt to the first dressing station or to the ambulance. Practically, therefore, the instruction that band members are receiving consists of exercises in the manual of the litter, viz., marchings with the litter, as litter squads composing a detachment so as to mobilize at a given point; searching for the wounded by scattering the several squads under charge of their respective squad leaders; the proper loading of the litters with the wounded, and their easy convoy to some designated spot, and the placing of the loaded litters in ambulances.

The Outfit of an U. S. Infantryman in active service consists of the following: Two blankets, 10 pounds; one rubber poncho, 2 pounds; one-half shelter tent, 2 pounds; one overcoat, 6 pounds; one pair shoes, 2 pounds; one cake soap, 3.5 ounces; one pair trousers, 3 pounds; one shirt, 1 pound; one shirt, 1 pound; one pair drawers, 14.54 ounces; one pair socks, 3.45 ounces; one towel, 2.4 ounces; one blanket bag, 2 pounds; haversack and rations, 9 pounds; rifle, bayonet, field belt, scabbard, 12.5 pounds; canteen filled and cup, 4.5 pounds; ammunition, 100 rounds, 6 pounds; total, 64.5 pounds. This does not include the weight of the clothing and incidentals, as pocket-knife, pipe, tobacco, money, etc., which would make the total nearer seventy pounds. But by a recent order from provisional headquarters, at Chickamauga, the men in the ranks are to be somewhat relieved. The knapsack, tent, blanket, overcoat, canvas suit, change of underclothing, soap and towels are to be carried on a wagon, two of which will be furnished to each company. This will leave some forty-seven pounds, enough of a burden under the tropical sun, where every pound pulls down with double the force of its actual weight.

Army Changes. Official List of Changes in the Stations and duties of officers serving in the Medical Department, U. S. Army, from June 18 to 24, 1898.

Major Junius S. Powell, Surgeon, will proceed from Ft. Riley, Kan., to Mobile, Ala., and report in person to Brigadier General William C. Oates, U. S. Vols., Fourth Army Corps, for duty as chief Surgeon on his staff.

Acting Asst. Surgeon Wylie G. Woodruff, U. S. A., will proceed from Lawrence to Ft. Riley, Kan., and report in person to the commanding officer of that post for duty.

Acting Asst. Surgeon John R. Devereux, U. S. A., will proceed from Washington, D. C., to Chickamauga, Ga., and report to Major E. C. Carter, brigade surgeon U. S. Vols., in charge of Leiter general hospital, for duty.

Capt. Jefferson R. Kean, Asst. Surgeon U. S. A., ordered to Jacksonville, Fla., to report to Major General Fitzhugh Lee, U. S. Vols., commanding Seventh Army Corps, for duty.

Capt. Peter R. Egan, Asst. Surgeon U. S. A. ordered to Tampa, Fla., to report to Major General John J. Coppinger, U. S. Vols., commanding Fourth Army Corps.

Capt. Henry R. Stiles, Asst. Surgeon T. S. A., having reported in person to the Surgeon-General of the Army, will report in person to Major Charles Richard, surgeon in charge of hospital train, for duty.

Capt. John S. Kulp, Asst. Surgeon U. S. A., ordered to Camp George H. Thomas, Chickamauga National Park, Ga., and will report to Major General James F. Wade, U. S. Vols., commanding Third Army Corps, for duty.

Major Charles Richard, Surgeon U. S. A., having reported in person to the Surgeon-General of the Army is assigned to duty in charge of the hospital train.

A board of officers to consist of Col. Charles C. Byrne, Asst. Surgeon-General; Major James P. Kimmell, Surgeon, and Major John D. Hall, Surgeon, is appointed to meet at Governor's Island, New York City, for the examination of such officers of the Medical Department as may be ordered before it, to determine their fitness for promotion.

Capt. William C. Gorgas, Asst. Surgeon, ordered to report to the president of the examining board, New York City, for examination for promotion.

CHANGE OF ADDRESS.

Adams, S. S., from Washington, D. C., to Mt. Lake Park, Md.
Bannister, H. M., from Oak Park to Evanston, Ill.
Bubna, C. W., from 190 Croton St. to 667 Quincy, Cleveland, Ohio.
Crudup, C. P., from Omaha, Neb., to Ryan, Ind. Ter.
Campbell, C. H., from Clarks to Osceola, Neb.
Chapman, W. S., from Gluch, Colo., to San Carlos, Ariz. Ter.
Chamberlin, W. A., from Rochester to Waseca, Minn.
Frost, C. A., from Chicago, Ill., to Almond, Wis.
Hillard, W., from California Bldg. to Box 742, Denver, Colo.
Hertel, L. L., from 233 22nd to 2212 Dearborn St., Chicago, Ill.
Isham, I. D., from 2441 Wabash Ave. to Chicago Beach Hotel, Chicago.
Jackson, E., from Philadelphia, Pa., to McPhee Bldg., Denver, Colo.
Lundgren, C. E., from 455 Pacific St. to 58 Norman Ave., Brooklyn, N. Y.
Martin, A. R., from 467 Milwaukee to 732 N. Hoyne Ave., Chicago, Ill.
Reamy, T. A., from Cincinnati to Stockton, Ohio.
Storie, J. G., from Shell Creek, Tenn., to Elk Park, N. C.
Searles, L. M., from Omaha, Neb., to Box 423, Kansas City, Mo.
Shattuck E. C., from 35 Myrtle St. to 614 Tremont St., Boston, Mass.
Wagner, T. H., from Chicago to Silver Cross Hospital, Joliet, Ill.
Wray, W. E., from Waupun, Wis., to Jacksonville, Fla.
Weaver, T. A., from Dayton, to Blachleyville, Ohio.

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